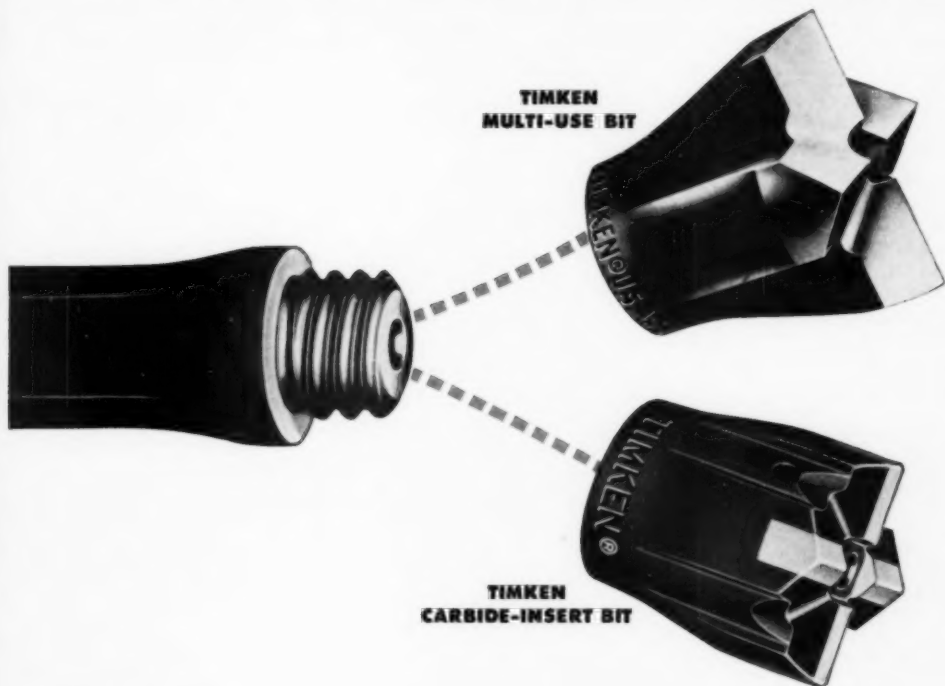


ROADS AND STREETS

APRIL 1955

SWITCH TO THE BEST BIT FOR THE JOB... RIGHT ON THE JOB



WHEN there's variable ground in the same property you can save drilling time and whittle your labor costs by using interchangeable Timken® rock bits.

Use Timken carbide insert bits to get through hard ground in a hurry. Switch to Timken multi-use bits when you run into softer ground. Both types fit the same threaded drill steel.

With correct and controlled reconditioning, Timken multi-use bits give you the lowest cost per foot of hole when full increments of steel can be drilled.

Timken carbide insert bits are the most economical bits for hard and abrasive ground, and your best bet for maximum speed, constant-gauge holes, small diameter blast holes and very deep holes.

Team up the two of them and you'll always have the best answer to every drilling need right at your finger tips.

Timken carbide insert bits and multi-use bits are inter-

changeable in each thread series. And remember that both types of Timken bits have these three important advantages: 1) made from electric furnace Timken fine alloy steel, 2) threads are not subject to drilling impact because of the special shoulder union developed by the Timken Company, 3) quickly and easily removable.

Call upon the 20 years' experience of our Rock Bit Engineering Service for help in selecting the best bits for *your* job. Write The Timken Roller Bearing Company, Canton 6, Ohio. Canadian plant: St. Thomas, Ont. Cable address: "TIMROSCO".

TIMKEN

TRADE-MARK REG. U. S. PAT. OFF.

**your best bet
for the best bit
...for every job**

LAPLANT-CHOATE MOTOR SCRAPERS

"Can't be beat for guts and roaring get-away"

WHEN you want the dope on scraper performance . . . the kind that gets the job done in schedule-trimming time . . . ask the operators. They're the boys who know to the last ounce what you can get out of a machine . . . and what you *should* get. They know an easy-operating, high-producing rig when they see one. That's why so many operators agree with Motor Scraper owners when it comes right down to choosing a scraper on the basis of performance, trouble-free operation and big production. Get the complete story from your LaPlant-Choate distributor.

Here's Another Operator's Viewpoint

Donald A. LaVigne of Worcester, Mass. says, "I've run every kind of scraper made and I'll take LaPlant-Choate any day. They're not only fast, they're safe. Another thing about them, I don't feel all beat up after running one all day. No more tiring than driving my car."

Don operates one of Bayer & Mingolla's fleet of six T5 300 Motor Scrapers.

Says: BILL CLEMENS of Northboro, Mass., T5 300 operator for BAYER & MINGOLLA Construction Company of Worcester, Mass.

BILL ADDS, "What we need on this job is a dozer for each machine because I make my haul, spread my load and am back waiting on the dozer every trip."



OPERATORS LIKE THESE LaPLANT-CHOATE FEATURES...

Positive, double-acting hydraulic steering for easy, effortless operation.

Big 4-wheel air brakes—22" x 7", for absolute safety at maximum operating speeds. 280 HP or 275 HP (your choice of either Buda or Cummins engines) for slugging power when it's needed.

Big tires—24:00 x 29, with plenty of traction and flotation.

High speeds—over 22 mph that cut valuable seconds off cycle time.

Big capacity—14-cu. yds. struck and 18-cu. yds. heaped means more dirt hauled in fewer trips.



LAPLANT

MANUFACTURING CO., INC.



CHOATE

CEDAR RAPIDS, IOWA, U. S. A.



Cable-operated Scrapers in 6-, 8- and 14-yd. sizes for all makes of track-type tractors.



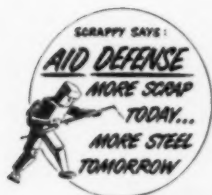
2- and 4-yd. Scrapers for track-type and rubber-tired industrial tractors.



Hydraulic and Cable-operated Dozers.



Grandpa Never Threw a Thing Away



It's only human to want to hold on to things after they've outlived their usefulness. That's why today millions of tons of worn-out and obsolete equipment and machinery are lying forgotten in the country's plants and factories and on farms.

The steel industry needs these millions of tons of dormant scrap, needs

it in the worst way. With this vital dormant scrap the entire steel supply picture would brighten up, with more steel for everybody. But without it, the steel industry cannot hope to keep up production at present levels.

Call in a scrap dealer now, today. He will buy your dormant scrap and start it moving toward the steel mills.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

More Scrap Today... More Steel Tomorrow

When writing advertisers please mention **ROADS AND STREETS**, April, 1952

ROADS AND STREETS

April, 1952 • Vol. 95 • No. 4

Roads and Streets represents 60 years of continuous publishing in the highway field; combined with Engineering & Contracting and Good Roads Magazines, established in 1892

E. S. GILLETTE, Publisher



HALBERT P. GILLETTE, Editor-in-Chief

H. J. CONWAY, Assistant Publisher

Coming Articles

Wet Weather or Not, Some Contractors Did Well

Resuming our "Knockin' out the Yardage" Department, with reports from earthmoving and paving contractors who achieved good yardage production on 1951 jobs.

A Million Square Yards of Massive Concrete

The Editor visits a southern airfield with camera and notebook—one of the bases currently being modernized for jets and heavier craft

All Welded Steel Box Girders Save Money

Design details of economical spans built recently for a county in Washington. One includes a 140-ft. girder, believed to be record length for the West.

California's Epic Snow Battle in the Sierra

Here is one of the most remarkable articles on snow removal which Roads and Streets has ever been privileged to run. (Still snowing in the Sierra's at this issue goes to press).

More New Machines for Mechanizing Roadside Work

Mr. Garmhausen will present another series of pictorial reviews on latest equipment, compiled through his Ohio work and national committee activities.

HAROLD J. McKEEVER, Editorial Director
C. T. Murray, Managing Editor
Cal. V. J. Brown, Associate Editor
W. W. VanStone, Production Editor

In This Issue

	Page
Grading and Paving for Lakewood: One Year City.....	49
Turnpikes Through the Wheatfields (Editorial).....	53
Sufficiency Ratings in Relation to Tolerable Standards and Priorities... 54	
By C. E. Fritts, Vice President, Automotive Safety Foundation	
Virginia's Busiest Routes Subject of "Need Study".....	57
Contractors Eye Big Brush Control Unit.....	58
Conclusions from Compaction Studies on Clayey Sands.....	59
Culvert with Removable Roof for Water Conduit.....	60
Designing World's Longest All-Welded Highway Structure.....	61
By Wendell F. Pond, Associate Bridge Engineer, California Division of Highways	
"Job and Equipment Ideas" Department.....	66
Hard Facing Helps Conserve Equipment in Nation's Biggest County... 68	
New Footings for Scoured Pier.....	70
By W. M. Stingley, Division Office Engineer, Kansas Highway Commission	
Florida Contractor Moves 30,000 C. Y. per Week.....	72
Gillette's Heavy Construction Catalog.....	77

BITUMINOUS ROADS AND STREETS

Cover Scene—"Then" and "Now" along Historic Virginia Road.....	85
Double Rail Loop Speeded Asphalt Production on Turnpike Job.....	89
On the New Jersey Turnpike with Savin and Kelley & Meyers.....	92
New Emulsion Plan Typifies Business Growth.....	95
Temperature Control of Hot Mixes.....	96
By H. G. Nevitt, Regional Manager, Socony-Vacuum Oil Company	
New Equipment and Materials.....	80, 104 and 113
With the Manufacturers and Distributors.....	118
Manufacturers Literature.....	120
Clearing House.....	125

A magazine devoted to the design, construction, maintenance and operation of highways, streets, bridges, bridge foundation and grade separations, and to the construction and maintenance of airports.

GILLETTE PUBLISHING COMPANY

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TANDEM ROLLERS



FEATURES

- Hydraulic steering.
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- Constant-mesh transmission.
- Large diameter compression roll.
- Rolling width 42 inches.
- Weight changed by adding or removing water ballast in rolls.
- Economical, 4 cylinder, 25 h.p. gasoline engine.
- Sprinkler tank and mats.
- Hydraulic hitch and transport attachments available (extra).

Write for literature.

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ESTABLISHED 1907

MOTOR GRADERS • ROLLERS

THE GALION IRON WORKS & MFG. CO., General and Export Offices — Galion, Ohio, U. S. A.
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*Straight-from-the-shoulder facts
show you save in every way with*

CHEVROLET *Advance-Design* TRUCKS

**FACT
No. 1**

COSTS LESS TO BUY

Match a Chevrolet truck against any comparable truck capable of handling the same payloads. You'll find Chevrolet trucks list for less, yet bring you ruggedness, stamina and great features not found in the other truck.

**FACT
No. 2**

SAVES MONEY ON THE JOB

Experienced truck operators know Chevrolet trucks cost least to own and maintain. Valve-in-Head economy, in the Chevrolet Loadmaster or Thriftmaster engines, saves on gas. Four-way engine lubrication reduces wear and oil costs. Rugged construction means long life.

**FACT
No. 3**

RIGHT TRUCK FOR EVERY LOAD

Chevrolet trucks are factory-matched to your payload and service requirements. You don't buy "too much truck" or "too little truck." Frame, axles, springs, body, brakes and power are balanced for the job.

**FACT
No. 4**

KEEPS ITS VALUE LONGER

Records show that Chevrolet trucks traditionally bring more money at resale or trade-in than many other makes. Chevrolet's market value stays up because the value stays in! More proof that Chevrolet is the best truck buy! See your Chevrolet dealer soon.

CHEVROLET ADVANCE-DESIGN TRUCK FEATURES

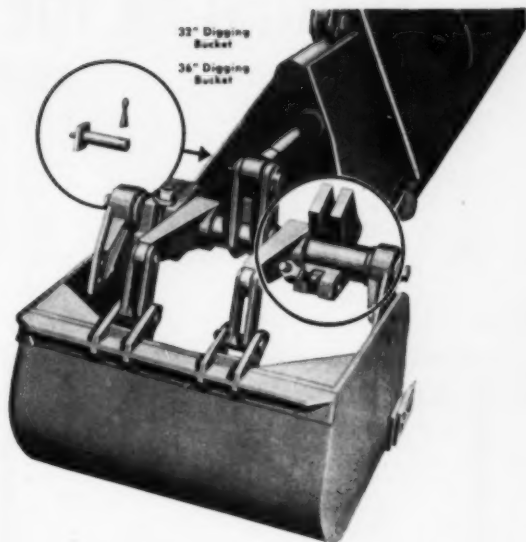
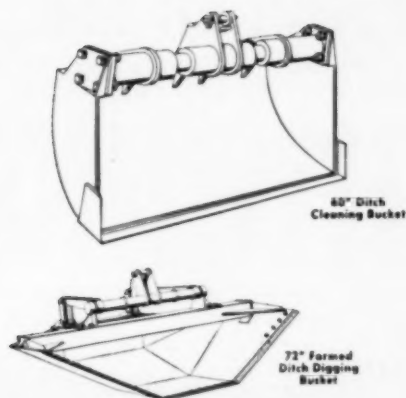
TWO GREAT VALVE-IN-HEAD ENGINES—Loadmaster or the Thriftmaster—is give you greater power per gallon, lower cost per load • **POWER-JET CARBURETOR**—for smooth, quick acceleration response • **DIAPHRAGM SPRING CLUTCH**—for easy-action engagement • **SYNCHROMESH TRANSMISSION**—for fast, smooth

shifting • **HYPOID REAR AXLE**—for dependability and long life • **TORQUE-ACTION BRAKES**—on light-duty models • **PROVED DEPENDABLE DOUBLE-ARTICULATED BRAKES**—on medium-duty models • **TWIN-ACTION REAR BRAKES**—on heavy-duty models • **DUAL-SHOE PARKING BRAKE**—for greater holding ability on heavy-

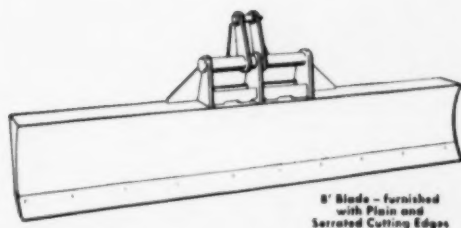
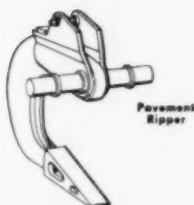
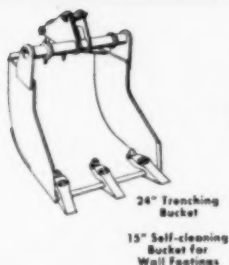
duty models • **CAB SEAT**—with double-deck springs for complete riding comfort • **VENTILANES**—for improved cab ventilation • **WIDE-BASE WHEELS**—for increased tire mileage • **BALL-TYPE STEERING**—for easier handling • **UNIT-DESIGNED BODIES**—for greater load protection • **ADVANCE-DESIGN STYLING**—for increased comfort and modern appearance.

CHEVROLET DIVISION OF GENERAL MOTORS, DETROIT 2, MICHIGAN





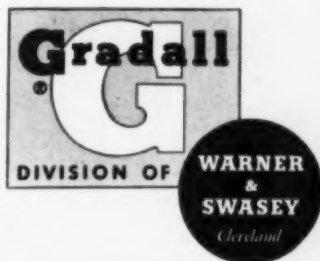
**In less time than changing a tire...
your GRADALL is a "new" machine**



NOW YOU CAN REPLACE several specialized construction machines, and practically all clean-up labor, with one versatile machine—the Gradall.

Shown are some of the wide variety of tools for the many specialized jobs performed by the Gradall. All can be carried right on the Gradall. And because they can be quickly interchanged, in a matter of minutes you can have a "new" machine for the job at hand—whether it's trenching, excavating, pavement removal, ditch cleaning, grading, or backfilling.

If your construction involves various types of jobs, this should give a good idea of how the Gradall can cut costs for you. Ask your Gradall Distributor for a field demonstration.

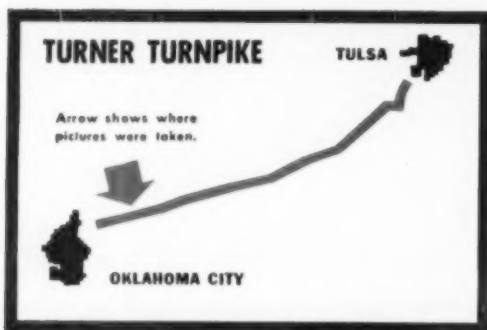


**Gradall Distributors in over
60 principal cities in the
United States and Canada**

GRADALL—THE MULTI-PURPOSE CONSTRUCTION MACHINE *with Controlled Down Pressure*

When writing advertisers please mention ROADS AND STREETS, April, 1952

Turning on the Power on the Turner Turnpike



"Big Red"—the International TD-24
—carries the load for contractors
on Oklahoma's new superhighway



12,500,000 cubic yards of earth are being moved to build the great new Turner Turnpike—a four-lane, limited access superhighway between Oklahoma City and Tulsa, 88 miles away.

Contractors on the job report that their International TD-24s are moving more dirt per day, because they have more power, more speed and more steer-ability than any other crawler on the market.

As Vernon Pool of Pool Construction Co. says, *"Nothing can beat these TD-24s. We have ten of them on our section of the Turner Turnpike. They out perform any other tractor I've ever seen. Our operators love them."*

"We've had all kinds of tractors, but the next ones I buy will be Internationals, too. One big reason besides their performance is that we always get prompt service from our International Distributor."

Get the low-down on TD-24 superiority from your International Industrial Distributor. Then consider the service he offers you—and you'll be a TD-24 man yourself from then on in!

INTERNATIONAL HARVESTER COMPANY, CHICAGO 1, ILL.



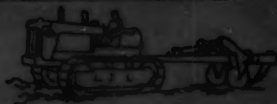
HAPPY CONTRACTOR is Vernon Pool (right) as he tells International Distributor D. V. MacDonald how good his TD-24s are. "One of them has 6,655 hours on the meter in three years," says Pool, "and it's working right along with the others."



INTERNATIONAL
POWER THAT PAYS



TEN TD-24s GIVE PLENTY OF POWER FOR POOL. Pool Construction Co. is one of seven contractors with fleets of International crawlers on the Turner Turnpike. Pool has 14 Internationals on its section of the job, and 10 of them are TD-24s. Here you see three of these "Big Red Champs" push-loading self-propelled scrapers.





Sound advice about **TRUCK POWER**

When you're sweating to get a rugged construction job done on schedule, you just can't afford to waste time with an underpowered truck—or one that's ill-fitted to its job.

That's why a Dodge "Job-Rated" truck is your best bet. It provides the kind of power that takes its job in stride!

Take a husky Dodge 2½-ton truck, for instance. With Twin Carburetion and Exhaust System, its sturdy high-compression engine turns out 137 horsepower!

It's mighty dependable power, too. Scores of up-to-the-minute features result in low-cost operation, long

life, and year-'round dependability. Consider, for example, such extra values as stellite-faced, sodium-cooled exhaust valves . . . surface-hardened bearing journals . . . intake valve and exhaust valve seat inserts . . . and others!

Add to all this the fact that there's a Dodge "Job-Rated" truck that's factory-engineered to fit your job and your power needs to a "T"!

So . . . why not get a truck that's designed especially to take sweat and strain out of your toughest jobs and put extra profits in. Get a Dodge "Job-Rated" truck! See your nearby Dodge dealer—soon.

DODGE "Job-Rated" TRUCKS

3/4
YARD

LORAIN
**TL
25**

LOADS OVER
1,600,000
TONS...

8 Years Work in 3

From August 1948 to June 1951, this 3/4-yard Lorain TL25 shovel has worked *continuously* for 16,000 grueling hours loading lead mill tailings . . . 24-hours-per-day . . . 7 days per-week. That's equal to almost 8 years of ordinary 40-hour-per-week service. Average output was 2400 to 3000 tons of material every 24-hours . . . somewhere between 1,600,000 and 2,000,000 total tons. This performance record explains why 2 more Lorain TL-25's have joined this "young veteran" which is still in service! With a Lorain "TL" on the job, you, too, can get record-breaking performance!

REASONS FOR RECORD-BREAKING "TL-25" PERFORMANCE

Check amazing Lorain "TL-25" performance with your Thew-Lorain Distributor . . . ask about these exclusive design advantages . . . ✓ "Packaged" Components — engine, clutch shaft, etc. — may be removed and replaced as complete units ✓ 5 identical, interchangeable clutches ✓ One-piece, all-welded turntable bed ✓ Anti-friction bearings ✓ Complete package design — no extras to buy ✓ 3 sizes of 2 speed crawlers ✓ 4 rubber-tire mountings ✓ 5 interchangeable front ends ✓ Get *all* the facts on the Lorain TL 25 from your nearby Thew-Lorain Distributor.

THE THEW SHOVEL CO., LORAIN, OHIO



LORAINS NO. 2 & 3 were purchased by this owner based on the steady 24-hour performance record of their first Lorain TL-25.

THEW
LORAIN

18½ FEET PER MINUTE

13 to 31 in. wide...up to 6 ft. deep



- 9 trench widths . . . wheel-type Model 202 digs 13 to 31 in. wide at depths to 6 feet.
- 30 digging feeds, 6.2 in. to 18.5 ft. per min.
- Enclosed friction clutches accurately control wheel depth for precision grading.
- Dual-purpose friction-type clutch drives digging wheel . . . protects against shock loads.
- Digging wheel truck-rollers are all fully equipped with antifriction bearings.
- Quick-change bucket fronts have cutting lips, or easy-in, easy-out "Tap-In" teeth.
- Shiftable, reversible belt conveyor discharges spoil to either side of machine.
- Full crawler mounting . . . 16 or 20-inch treads . . . only 6 or 5 lbs. PSI pressure.

Send for: **PARSONS COMPANY, NEWTON, IOWA**
for specifications, price information on 202 Trenchliner.

NAME _____

COMPANY _____

STREET _____

CITY, STATE _____

☐ Also send details on pipeline Model 215.

CP26785



PARSONS COMPANY
NEWTON, IOWA

(Kochring Subsidiary)

4 TRENCHLINER models: 2 wheel-type, 2 ladder-type full crawler mounted, and utility trencher (model 202) on rubber

PARSONS wheel-type 202 Trenchliner combines big work capacity with precision grading accuracy. Wide range of digging feeds, widths and depths fits special requirements of municipal and utility trenching . . . farm, airport, highway drain-tile jobs . . . irrigation ditching . . . oil, gas, gasoline transmission lines, etc.

Specified grades are easy to maintain because digging wheel responds instantly to sensitive friction-clutch control. Arched wheel frame, rigidly trussed, and three double-wheeled guide rollers keep digging wheel precision aligned. Hinged crumber sweeps trench bottom clean, ready for pipe. Tile-laying box and chute (optional) saves time, labor on drainage jobs.

For full details on this big-production 202 Trenchliner, see your Parsons distributor, or write us.

with PARSONS 202 wheel-type TRENCHLINER®



▲ FOR CROSS-COUNTRY TRENCHING

... here's another Parsons wheel-type Trenchliner ... pipeline Model 315. It has 6 digging wheels speeds up to 113.3 f.p.m. ... chains of square or round-bottom buckets ... standard trench-type crawlers with 18" tracks, legs ... standard 24 ton diesel engine.

1-SECOND DISCHARGE with Kwik-Mix 11-S

Saving important seconds on every batch of concrete, tilted Flow-Line Discharge Chute pours full 12.1 cu. ft. batch in 7 seconds. Kwik-Mix 11-S Dandie® also has side or end discharge, 2 or 4 wheels, and special tower attachment. Other sizes: 3½-S to 16-S. Also check Kwik-Mix bituminous, tilt and non-tilt plaster-mortar mixers ... and Moto-Bug® (power wheelbarrow) shown here. Ask your Kwik-Mix distributor for all facts.

KWIK-MIX (Koehring Subsidiary)
Port Washington, Wis.



2, 3 or 4-material Johnson "Hi-Speed" Batchers

... are "Hi-Speed" because extra wide, 15"x36", fill valves and wide bin top openings reduce charging time ... steep side slopes give fast, clean discharge. Standard batcher handles 34-E paver batch. For charging truck mixers, 4 material "Hi-Speed" Batchers can be furnished with 2, 3 or 4-yd. weigh hoppers having double clam discharge gate and collector ring. Also check the complete Johnson line of mix plants, bins, buckets and silos.

C. S. JOHNSON (Koehring Subsidiary)
Champaign, Ill.



½-yd. ... 10-ton Heavy-Duty Koehring

Versatile Koehring 205 uses the same dual-purpose boom for ½-yard shovel or hoe. Readily converts to clamshell, dragline or lift crane ... lifts 7½ to 10 tons, depending on crawler or rubber tire mounting. All main clutches are self-adjusting, have heat-compensator springs that make tension changes automatically, maintain full clutch efficiency at all times. Other Koehring heavy duty sizes to 2½ yds., 79½ ton capacities.

KOEHRING COMPANY
Milwaukee 16, Wis.



Where only the best is a bargain!

On a really tough hauling job, a truck's either got it, or it hasn't.

You either make money or you lose it. Only the *best* truck engineered for the job is a bargain for the operator.

That's why you see so many Internationals on tough jobs. That's why you'll be money ahead to see your International Truck Dealer or Branch and get the *best* truck engineered for your job. Why not make it *soon*?

INTERNATIONAL HARVESTER COMPANY • CHICAGO

Get the facts about International's features:

- All-truck engines—exclusively for truck work—built in the world's largest truck engine plant.
- The "roomiest, most comfortable cab on the road"—the Comfo-Vision Cab designed by drivers for drivers.
- Super-steering system—more positive control, easier handling and 37° turning angle.
- Traditional truck toughness that has kept International first in heavy-duty truck sales for 20 straight years.
- 115 basic models . . . everything from ½-ton pickups to 90,000 lbs. GVW off-highway models.
- America's largest exclusive truck service organization.



International Harvester Builds McCormick Farm Equipment and Farmall Tractors . . . Motor Trucks . . . Industrial Power . . . Refrigerators and Freezers

INTERNATIONAL TRUCKS "Standard of the Highway"



Model LF-210, 157-in. wheelbase,
8-yard dump body, 37,000 lbs. GVW

a **STRAIT-LINE** is Your Shortest path



Digs in Rear ... or Digs in Front

AND, IT MULTIPLIES TRACTION ... SAVES TURNING
MAKES STEERING EASIER ... INCREASES STABILITY



Push-Tilt assures fuller buckets even in fine plaster sand.



It takes plenty of traction to move from bank to truck in rough going like this. Rear-carried bucket makes it possible. And, in hard banks, the extra traction and Push-Tilt give you the same fast, profitable loading.

But here is its
Biggest Advantage

... ADDED TRACTION FROM REAR-CARRIED BUCKET

An Oliver Industrial Wheel Tractor and Strait-Line Loader is the biggest profit asset for any loading operation. It digs in back ... or digs in front ... and loads in front. No time-wasting turning or backing required.

Here's proof. These photos were taken loading out plaster sand, so fine it squirted out through a ten-penny nail hole in the truck body in a stream 4 inches long. Despite this difficult going, the tractor and Strait-Line wheeled its bucket loads *upgrade* without spinning. It

ran back from truck to bank with force. This extra traction for difficult conditions is created by the rear carried bucket.

This is a condition where rear digging solved the problem. In fact, under most conditions, the operator can do *more* with rear digging.

Why not check the Oliver Industrial Wheel Tractor Strait-Line for your loading.

THE OLIVER CORPORATION

Industrial Division: 19300 Euclid Avenue, Cleveland 17, Ohio

A complete line of industrial wheel and crawler tractors.



THE OLIVER CORPORATION
19300 Euclid Avenue, Cleveland 17, Ohio
Please send me literature on the versatile Oliver
Wheel Tractor Strait-Line Loader.

Name.....
Company.....
Address.....
City..... Zone..... State.....

why are **BUDA DIESELS** your best buy in power?

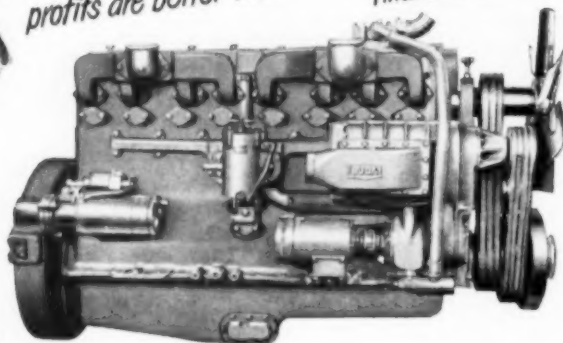
CONTRACTOR:



"Buda Diesels get my jobs done faster. I don't worry about penalty clauses any-more... profits are better too!"

MAINTENANCE SUPERINTENDENT:

"I like their simple design..they're easier to maintain. They don't jerk our equipment to pieces-engines, clutches, transmissions final drives and tires last longer."



OPERATOR:



*"More Torque means less shifting- easier handling
More trips per day"*

JOB SUPERINTENDENT:

*"Buda Diesels keep going. Down-time is at a minimum.
Buda powered units really move dirt"*



POWER FOR PROFIT WITH BIG BUDA DIESELS

Look at it from any angle—big displacement Buda Diesels give you more power and more profit for your money. Buda Diesels' 13 to 25% greater piston displacement . . . 9 to 23% more torque and lugging ability give your payoff equipment the power to move more yardage at lower cost.

Your Buda Distributor can prove the money-making advantages of Buda dyna-swirl Diesels. Ask him today. Write for Bulletins and data. The Buda Company, Harvey, Illinois.

*a Power-Full and Dependable
Name in Engines...*

BUDA

Manufacturers of Diesel and Gasoline Engines, Maintenance of Way Products, Lifting Jacks, Earth Drills and Material Handling Equipment

How to make OLD SHOVEL PARTS OUTLAST NEW ONES!

**if you want more service
from wearing shovel parts
protect them with STODY ALLOYS**

ORIGINAL EQUIPMENT SIZE IS RETAINED. As most parts lose size, they also lose efficiency . . . worn teeth and worn bucket lips don't take a full bite. Worn idlers, pads and rollers cause trouble and delay. *Stody Alloys give the protection where you need it, maintain all-important size!*

CONCENTRATED WEAR AREAS RECEIVE EXTRA PROTECTION. Bucket sides and bottoms develop distinct wear patterns. A few stringers of hard-metal in these areas slow down effects of wear, equalize overall bucket life.

LESS DOWNTIME—FEWER REPLACEMENTS. Hard-facing usually doubles part life. On specific items, increases up to 3 or 4 times have been noted. *Keeping parts in operation means less downtime for repairs, fewer costly replacements!*

**Why not get the most
from your shovels
by hard-facing now
with STODY ALLOYS?**

Available for manual or
automatic welding methods.

Consult your nearest Stody Dealer listed in
the Yellow Classified Telephone Directory under Welding
Equipment & Supplies. He will recommend the BEST Stody
Alloy for your job and provide a list of local job welders
having Automatic Welding facilities—or write direct.

TRACK PADS

resisted with
Stody 1027 are
good for double
original life.



HARD-FACED SHEAVES

very important, large sheaves
larger because sheaves
resist grooving. Automatic
hard-facing with Stody 107
does the trick economically—
saves many times its life.



BUCKETS AND TEETH

used combined stringer
beads of Stody Self-
Hardening 51. Stringers
catch earth, form wear
barriers.



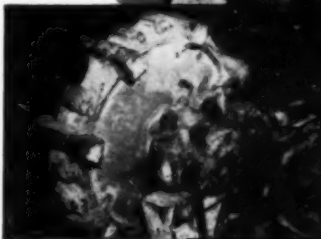
IDLERS AND TRACK ROLLS

are ideally hard-
faced by automatic
process using
Stody 102 and
Stody 105 . . .
Maintain size and
shape, double life.



DRIVING TUMBLERS

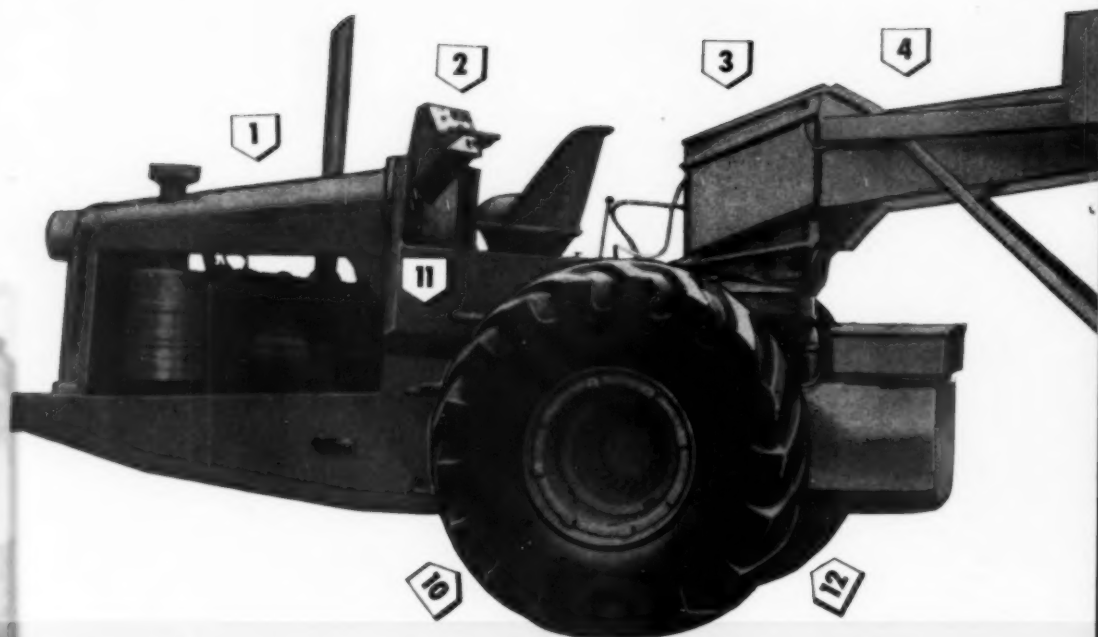
are hard-to-size or easily
rebuild by manual applica-
tions of Stody Self-Hard-
ening or Stody 1027, out-
wear new parts 2 to 1.



STODY COMPANY

11723 N. Mission Avenue
Whittier, California

Here's the **BOTTOM**



Le Tourneau 18-yd. **TOURNAHOPPER**

- 1** Over 5 h.p. per ton of gross weight ... works with job-proved 186 h.p. C Tournapull prime mover ... has plenty of power to haul full 18-ton loads up steep grades.
- 2** Fingertip electric switches, control dump and steer ... respond instantly ... increase safety margin ... reduce operator fatigue ... eliminate "end-of-shift" letdown. No troublesome hydraulic system.
- 3** Positive electric power steer swings prime mover without use of final drive ... "walks" rig out of mud-holes to firmer footing ... permits safe, accurate working and turning on steep slopes.
- 4** 90° turns within 15'8" radius give 34'-long Tournahopper exceptional maneuverability for fast turns off fill, away from loader, and while hauling along narrow levee roads.
- 5** Big, steel-reinforced bowl carries up to 18 tons ... has 18 cubic yard capacity. Bowl withstands shock loads of rock and other heavy materials ... reduces body maintenance costs.
- 6** 9' x 11' top opening, low 8'9" loading height, provide big target ... speed shovel, dragline swings, reduce spillage. Rig "tops out" loads with minimum movement under belt loader.
- 7** Dump doors lift high, leave bottom opening approximately same as top. Rocks, sticky material, dirt dump fast without damaging gates. Everything that goes in the top easily comes out the bottom.
- 8** Power-controlled "clamshell" doors wipe clean as they lift to swing up and out ... open full width or partially for controlled dump. No dangling gates.

C Tournahopper prime mover is readily interchangeable with these 4 other hauled units to fit future job requirements.



18-ton rear-dump
TOURNAROCKER**



14-yd. (18-ton)
TOURNAPULL*



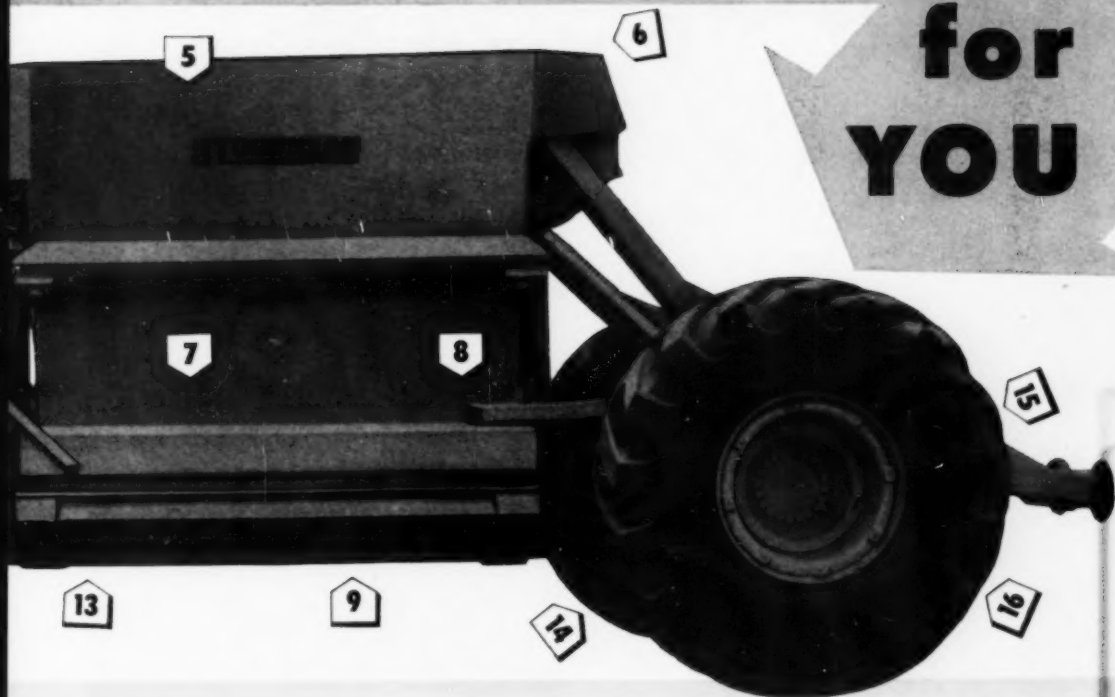
15-ton
TOURNACRANE*



20-ton flatbed
TOURNAHAULER**

* Trademark Reg. U. S. Pat. Off.
** Trademark

- DUMP dirtmover for YOU



gives you all **THESE FEATURES:**

- 9** 25" ground clearance under hopper permits fast dump and turn over deep windrows. Open doors clear 42" and with prime mover in 90° turn position, you can swing to clear 42" boulders.
- 10** 51% of loaded weight on drive tires gives plenty of traction in spongy, wet going. No "extra" small steering wheels to rob power as they break trail and bog down in soft going.
- 11** Constant-mesh transmission (with torque converter) available for instant gear changes. Torque converter automatically selects proper gear ratio, provides maximum power at all speeds, 0 to 33 m.p.h., removes shock loads in power train.
- 12** Torque-proportioning differential automatically delivers up to 4 times the tractive power of slipping drive wheel to wheel on firmest footing.
- 13** Optional "Electrotarder" warms body electrically, keeps loads from freezing.
- 14** 4-wheel, multiple-disc air brakes, 3,763 sq. in. braking surface (more per ton than any other hauler) give operator confidence to use high speeds.
- 15** Big 21.00 x 25 low-pressure tires, all around, operate at pressures as low as 30 lbs., give extra flotation, minimize rutting in soft ground. They have less rolling resistance than duals... are bigger, stronger, heavier than duals... better adapted to withstand load and haul shocks. There's no divided face for rock fragments to wedge in and tear.
- 16** Trouble spots eliminated — no frame, sub-frame, springs, spring hangers, drive shaft, front-end steering wheels, or hydraulic system... less time out for maintenance... lower maintenance costs... smaller spare parts stock required.

Let us show you how Tournahoppers can lower your bottom-dump hauling costs.

Tournahopper—Trademark Tournapull—Trademark Reg. U. S. Pat. Off. 8225

R. G. LeTOURNEAU, INC., Peoria, Illinois

HIGH-SPEED, RUBBER-TIRED EXCAVATING • HAULING • LIFTING EQUIPMENT



BIG Tractor-shovel with **BIG** push



4-wheel drive **PAYLOADER[®]**

Contractors and Public Works men are happy with the big Model HM 1½ yd. "PAYLOADER" because of the combination of power, mobility and versatility it gives them — power and 4-wheel traction to get *big* production even when ground conditions are poor . . . mobility to get from job to job quickly at speeds up to 16 m.p.h. . . . versatility to dig, load, grade, bulldoze, spread, pull and push . . . to work on or off pavement.

This tractor-shovel also makes a hit with operators because it rides easy and has a big comfortable seat, power-assisted steering and fingertip hydraulic control.

Four speeds *reverse* as well as forward permit as fast operation in both directions as the job conditions allow, and there's a choice of gasoline or diesel power. Once you've seen a Model HM in action you'll understand why hundreds of owners and operators are its enthusiastic boosters.

The Frank G. Hough Co., 768 Sunnyside Ave., Libertyville, Ill.



WRITE for catalog on the 1½ yd. Model HM or the six other "PAYLOADER" sizes down to 12 cu. ft. bucket capacity.





"This is where we came in ..."

The picture that's coming up on the "news reels" now is one that we all remember. Once again Uncle Sam is a big machinery customer with first call on output.

This doesn't mean that we can't take care of our old customers . . . but it may mean that we can't do it as promptly as you've learned to expect. You may have to wait a bit longer for that new shovel, dragline or crane. But it's in a worthy cause . . . and to compensate, may we suggest that you take a little extra care to make your present equipment last?

We're not suggesting that you pamper the machines.

Lima equipment is designed and built to take a terrific beating, and you can keep right on demanding a full day's work from every unit. But almost every piece in service gets some unnecessary punishment, because proper maintenance is neglected. If you focus on proper care—which every good piece of machinery deserves—you'll keep the Lima's at their working peak considerably longer.

For further information
write to

BALDWIN-LIMA-HAMILTON CORPORATION
Lima-Hamilton Division
Lima, Ohio, U. S. A.



OFFICES IN PRINCIPAL CITIES OF THE WORLD

BALDWIN-LIMA-HAMILTON

SHOVELS • CRANES • DRAGLINES • PULLSHOVELS • TRUCK CRANES

HERE'S WHY

THE BUFFALO-SPRINGFIELD

KT/7

IT'S A CONVENTIONAL TANDEM ON THE JOB

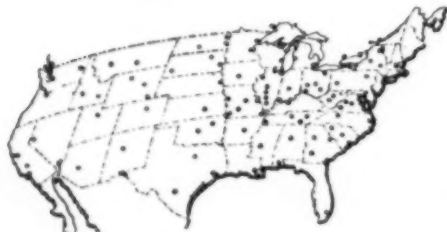
The 3 to 5 ton KT7 is ruggedly built to designs that have made Buffalo-Springfield Rollers famous the world over. Guide and drive rolls are made of heavy steel plate. The compact 4-cylinder engine delivers 24.2 horsepower through a simple two-speed transmission and the famous Buffalo-Springfield bevel gear final drive.

EASILY RIGGED FOR TOWING

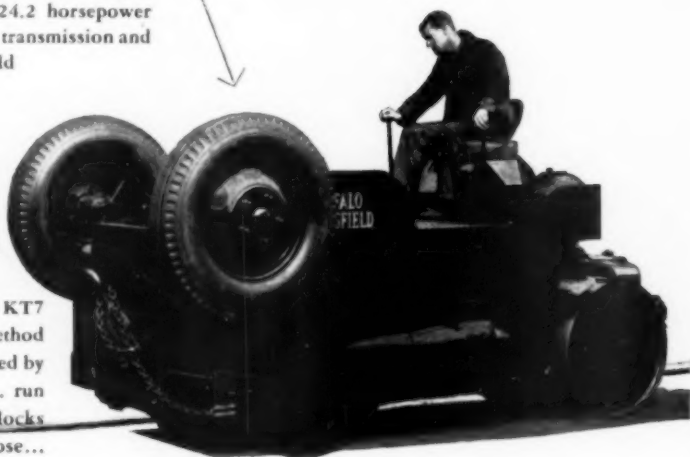
One man can rig the KT7 for towing by this method originated and developed by Buffalo-Springfield . . . run the roller up on wedge blocks provided for this purpose . . . remove wheels from carrying bracket and insert in towing position . . . hook up towing attachment to truck . . . use built-in hydraulic jack to raise the drive roll.

... IN JUST 3 MINUTES
the KT7 is ready
to travel

THERE'S A BUFFALO-SPRINGFIELD DISTRIBUTOR
CONVENIENTLY LOCATED TO SERVE YOU



IS THE WORLD'S
most useful
PORTABLE



A WILLING WORKER FOR MANY JOBS

Driveways, parking lots, roads and streets, maintenance . . . easy portability of the KT7 makes it possible to accomplish many jobs in a single day. It's a willing worker, too—hydraulic steering and exceptional maneuverability make jobs go fast—save wear and tear on operators—give you a quality job you'll be proud of.

And KT7's low cost and time-saving ability will mean a new rate of profit for your operation.

ASK YOUR DISTRIBUTOR FOR COMPLETE DESCRIPTION
AND SPECIFICATIONS IN BULLETIN S-58-49 OR WRITE

BUFFALO  **SPRINGFIELD**
SPRINGFIELD, OHIO

THE BUFFALO-SPRINGFIELD ROLLER COMPANY

New Ultra-modern Low-Friction truck engines give you

Gas Savings ^{UP} TO 14%

Designed for today's Speed Hauling needs!

New **LOW-FRICTION** design
LIBERATES POWER ordinarily
held "captive" by engine
friction! **IT SAVES GAS!**
It saves wear!

Good news for truck users! Ford's new, ultra-modern **LOW-FRICTION** truck engines break away from the traditional "European" long-stroke piston design. They introduce a friction-reducing *short-stroke* in three completely new engines in Ford Trucks for '52.

Ford **LOW-FRICTION** design incorporates new direct-breathing **OVERHEAD-VALVES** . . . gives you new **HIGH-COMPRESSION**, for extra wallop to meet today's Speed-Hauling needs. Here's truck engineering that your Ford Dealer will be proud to tell you more about today!

Availability of equipment, accessories and trim, as illustrated, is dependent on material supply conditions.

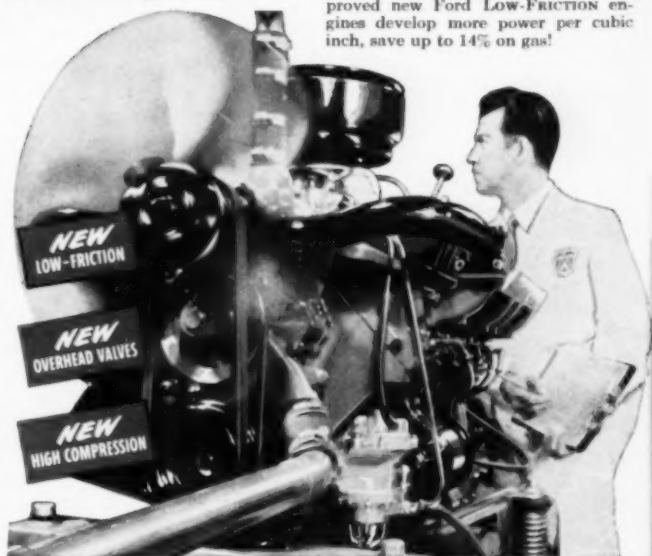


For '52 Ford offers a full line of trucks from half-ton Pickups to 20-ton (G.C.W.) Big Jobs. 5 great engines from 101 h.p. to 155 h.p., V-8 or Six. 3 new **LOW-FRICTION** Engines, plus famed V-8 (now 106 h.p.) and Big Six (now 112 h.p.)!

FORD TRUCKS for '52 cost still less to run !

When writing advertisers please mention **ROADS AND STREETS**, April, 1952

DYNAMOMETER TESTS like this, over 50,000 hours on one engine model alone, proved new Ford **LOW-FRICTION** engines develop more power per cubic inch, save up to 14% on gas!



NEW LOW-FRICTION DESIGN

OVERHEAD VALVES for deeper direct "breathing"!

HIGH-COMPRESSION punch with regular gas!

SHORT STROKE cuts piston travel up to 20%!

Friction reduced in many ways: **Autothermic Pistons** have built-in clearance control. **Precision-molded Alloy Crankshaft** cuts friction and wear at journals. **New Full-Flow Oil Filter** screens every drop of oil every time around. **Result:** Up to 30% cut in friction "power-waste" . . . the big reason why Ford can promise gas savings up to 14%!



FREE

MAIL THIS
COUPON
TODAY!

Ford Division of FORD MOTOR COMPANY
3258 Schaefer Rd., Dearborn, Mich.

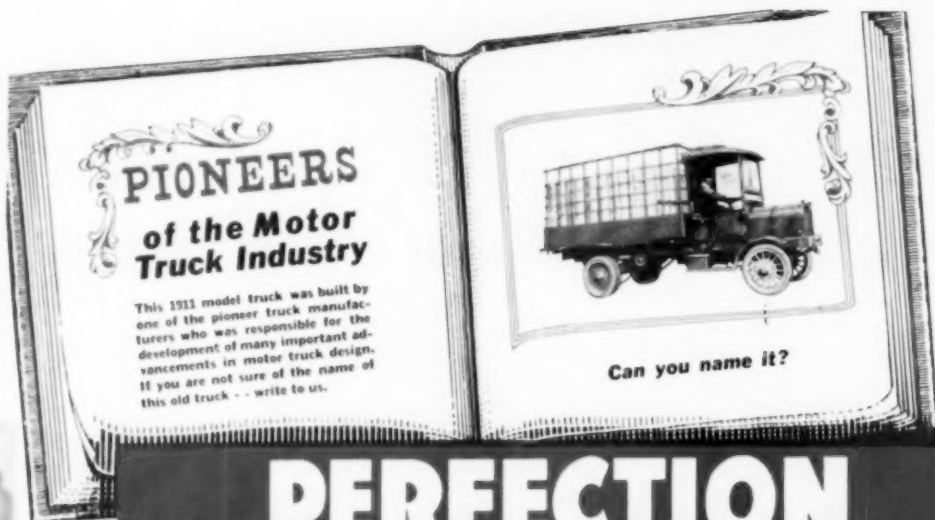
Please send me without charge or obligation, complete details on the new Ford Trucks for '52 and the five great Ford Truck Engines!

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LIGHT MODELS ☐ EXTRA HEAVY-DUTY MODELS ☐

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Has Led in Body and Hoist Design

by keeping pace with all modern truck engineering



No sooner did the early possibilities of the motor truck become established than the need arose for a variety of special purpose bodies and hoists for various payload body capacities. **PERFECTION**, another pioneer, did something about that need by combining soundly engineered practical designs with quality construction.

Photo at left shows a **PERFECTION** Iso-Draulic Roll-A-Lift mounted with a **PERFECTION** style 354 Dump Body. This patented hoist was pioneered by **PERFECTION** to lift the tremendous loads of modern haulage requirements. Pressure in the cylinders remains constant from riding position of body to full dumping angle.

Write Dept. R-42 — for literature

PERFECTION
TRUCK BODIES and
HYDRAULIC HOISTS

FOR ANY TRUCK
STANDARD or SPECIAL UNITS
IN ALL SIZES • FOR ANY USE

Engineered, Manufactured, and Guaranteed by
THE PERFECTION STEEL BODY COMPANY Galion, Ohio, U. S. A.

the Power Graders THAT HAVE EVERYTHING

8 Important Features Never Before Combined in a Motor Grader

30 minutes of action, in 16 mm. color and sound, demonstrating the performance of Austin-Western Power Graders and Attachments on a wide variety of jobs. Your nearby A-W distributor will be glad to schedule a print for your use.

Precision Sideshift

which keeps
the blade under
perfect control.

High-Lift Blade

for accurate work
on any degree
of slope.

Extreme Blade Reach

which comes in
handy on the
majority of jobs.

All-Wheel Drive

with its tremendous
climbing power
in the front
drivers.

All-Wheel Steer

which makes the
grader twice
as maneuverable.

Controlled Traction

which moves
more material,
farther and
faster.

Completely Reversible Blade

for those rare
occasions when
it is necessary.

Full Hydraulic Control

with its instant,
fingertip
action.

AUSTIN-WESTERN COMPANY · Subsidiary of Baldwin-Lima-Hamilton Corporation · AURORA, ILLINOIS, U.S.A.

Austin Western



SINCE 1829—80 YEARS—CONSTRUCTION EQUIPMENT



**9500
POUNDS OF
APPLIED POWER**

MAKE *HASH* OF CONCRETE...

Contractor digs and loads old paving with HT4 TRAXCAVATOR!

One man on the seat of the HT4 TRAXCAVATOR controls 9,500 pounds of pushing power concentrated on the rugged bucket . . . he has a lifting power of over 6000 pounds. This applied power digs out old, cracked concrete paving in loadable chunks.

The HT4 will handle this job and hundreds more just as tough. It's built with durability . . . a machine that can turn in profitable production on concrete-busting and easily make big money on "soft" digging, loading and grading tasks.

TRAXCAVATORS are unit-engineered to "Caterpillar" Diesel Tractors for longer life, greater production and lower costs. Ask your "Caterpillar" Dealer for information on the model that can do your work — at a profit . . . or write direct for further information.

TRACKSON COMPANY, Milwaukee 1, Wis.
A Subsidiary of Caterpillar Tractor Co.

TRACKSON

**TRAXCAVATORS®
TRACLOADERS
PIPE LAYERS
EARTH AUGERS**

GOING'S ROCKY

...but it just keeps 'dozin' along!

You can see what conditions were like on this road-building job near Henrieville, Utah. The altitude's 7,000 feet. In 2½ miles, about 160,000 cu. yds. 85% rock had to be moved. To move it, Whiting & Haymond relied heavily on "Caterpillar" units—among them, this D8 Tractor with No. 8U Bulldozer. Supt. A. H. Cranmer said: "'Cat' Diesel Tractors are tops for work of this nature. With the amount of rock we had here, they stood up to it all day long and it never hurt them. Our 'Caterpillar' Dealer took care of us in grand shape."

Mr. Cranmer makes two good points. First, "Caterpillar" units stand up under tough going. Second, you get good service from your "Caterpillar" Dealer. However, it's just common sense not to wait until the last minute to call on him. Have him rebuild parts *before* wear damages them beyond repair. And see that your rigs get proper maintenance attention on the job. That takes only a few minutes a day, but it's an important factor in adding many *extra* working hours to the life of your sturdy "Caterpillar" equipment.

CATERPILLAR TRACTOR CO. • Peoria, Illinois

CATERPILLAR

REG. U. S. PAT. OFF.

DIESEL ENGINES
TRACTORS • MOTOR GRADERS
EARTHMOVING EQUIPMENT

YOUR CHOICE OF

3 GREAT B-TYPE SCRAPERS

(10 yd. struck, 14 yd. heaped). Engineered especially to work with the International TD-18A Tractor and make a matched dirt-moving team of championship caliber.

B-113



B-250

(22 yd. struck, 27½ yd. heaped). Largest scraper in current production available for use with crawler tractors. Developed along with the International TD-24 tractor to fully apply its unusual working capacity.

B-170A

(16 yd. struck, 21 yd. heaped). Has greatest struck capacity of the scrapers loaded without pusher assistance. Designed as the companion to the TD-24 tractor — takes full advantage of its superior speed and power.



Each of these three Bucyrus-Erie B-Type Scraper models loads with the same "fountain" action that breaks up chunks and boils material up through to fill the bowl completely.

Each hauls easily on big tires, and has the stability that comes with low bowl height, wide spaced rear wheels and proper weight distribution.

Each dumps fast and clean with the same positive rolling action — a type of ejection that requires less horsepower and thus permits dumping in higher tractor gear.

Each has the design refinements and strong construction throughout that mean extra ease of handling and servicing, extra yardage hauled, extra long life.



SOUTH MILWAUKEE, WISCONSIN

BIG RED TEAM CONTINUES TO WIN ON PERFORMANCE

Time after time the Big Red Team — International TD-24 Tractor and Bucyrus-Erie B-250 or B-170A Scraper — comes out on top in actual field tests. It hauls more yards, loads and dumps faster, has shorter overall cycle time than comparable units. But why not find out for yourself? Ask your International Industrial Tractor Distributor for a demonstration.

BT52C



Gillette's

1952

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In the next edition I would like to see the catalogs of the following manufacturers:

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My Company or Department Name

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NOW...MAKE WAY FOR A REAL Money-maker!

HERE'S the new $\frac{3}{4}$ -yard **AMERICAN Crawler**... the machine that *changes the picture* in shovel, pull shovel, dragline and crane work.

Every new idea built into this machine was checked, tested and approved as a *money-maker*. For example, dozens of features improve ease of control... and ease of control means *more work with less effort*.

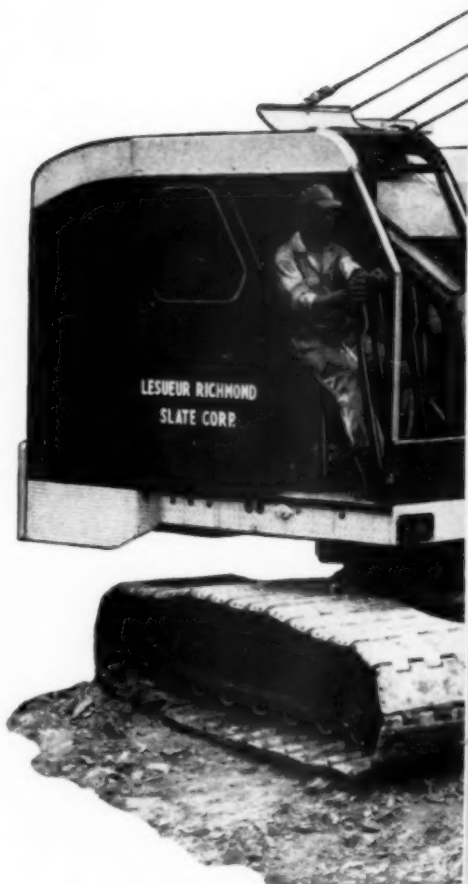
Touch the brake pedals, and feel anti-friction bearings throughout the linkage—60% of effort eliminated! Clutches respond to finger-tip pressure. To trip the dipper, touch an electric button. And, as standard equipment, your boom has controlled power lowering.

Are you in business to make money? Let's talk about an American Crawler for you—shovel, pull shovel, dragline or crane.

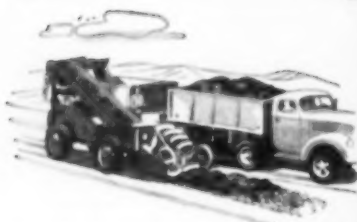
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**American Hoist
& Derrick Company**

69 S. ROBERT STREET • ST. PAUL 1, MINN.







Clamshells, front-end loaders, conveyor-type bucket loaders, crawler mounted rigs — they're all outmoded on stockpile or windrow loading since the introduction of the new Athey HiLoader.

HERE'S WHY THE ATHEY HiLoader IS BETTER

HI-CAPACITY

10 yds. per min.

HI-FLEXIBILITY

Loads from any stockpile or windrow.

HI-MOBILITY

20 MPH

HI-LOADING

12' 10" Discharge Height

HI-SAVINGS

One Operator,
Lower Maintenance

HI-COMFORT

Operators like it. They sit or stand and drive it like their automobile.



The New Athey HiLoader will boost your production, cut your costs and give you more savings. Designed for more efficient and faster loading from stockpile or windrow, the HiLoader is the result of four years of research, engineering and testing. It is a "field proved" machine backed by performance on scores of tough jobs in a variety of industries. See it in action. Prove to yourself this is your best answer to lower your increasing costs. See how the auger feeder, the discharge conveyor that can be swung 45° left or right, short wheelbase, cleated main conveyor, full-floating underslung paddle-blade feeder, large tires and simple controls all add up to the most practical loader in the field today.

For more complete information on this sensational machine, wire, phone or write:

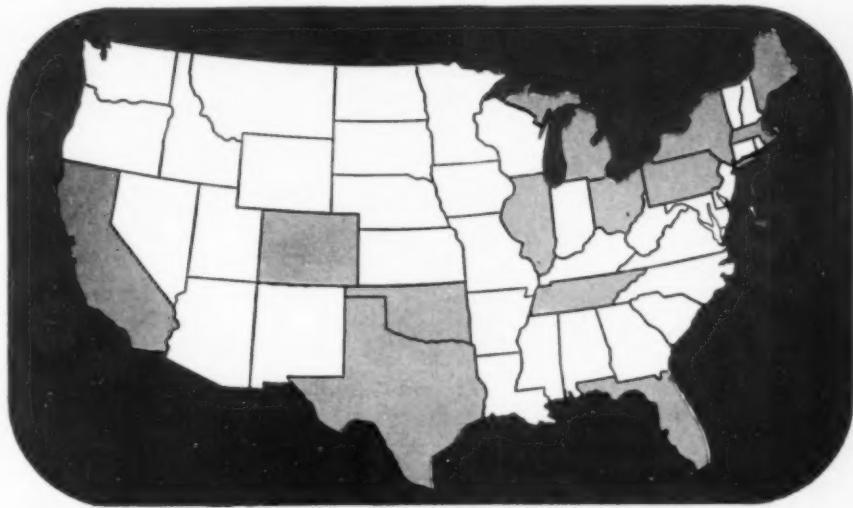
ATHEY PRODUCTS CORPORATION
5631 West 65th Street, Chicago 38, Illinois

or see your Athey-"Caterpillar" distributor.

Athey

FORCE-FEED HiLoader

PRESTRESSED CONCRETE



Now accepted from Coast to Coast

BRIDGES in Massachusetts, more bridges in Pennsylvania, a factory roof in Ohio, bridges and buildings in Tennessee, a ramp garage in California . . . these and scores of other construction jobs have been designed to use prestressed concrete. Every week more and more leading engineers investigate, then accept, this new material.

To meet the growing demand for the special tensioning members required, Roebling has developed a full line of new products. They are Prestressed Concrete Wire and Strand for pre-tensioning . . . Strand and Fittings for post-tensioning. Each has been developed to meet the special requirements of any prestressed concrete design.

Roebling Wire and Strand for pre-tensioning are made of high tensile acid steel that results in products of exceptionally high elastic characteristics. And they are specially treated to greatly increase their bonding quality, too.

Roebling Strands for post-tensioning are fabricated from special hot galvanized acid steel wire

. . . insuring exceedingly high strength and elastic properties. At recommended stresses, there will be complete safety . . . no relaxation of the steel during the life of the structure. Our fittings develop the full strength of the strand without exceeding the yield point of any of their parts. They are attached at a Roebling plant and proof-loaded beyond recommended stresses. This factory-assembled method brings huge labor savings on the job.

Prestressed Concrete is growing by leaps and bounds. Keep abreast of the Roebling product developments. Write Prestressed Concrete Department, John A. Roebling's Sons Co., Trenton 2, N. J.

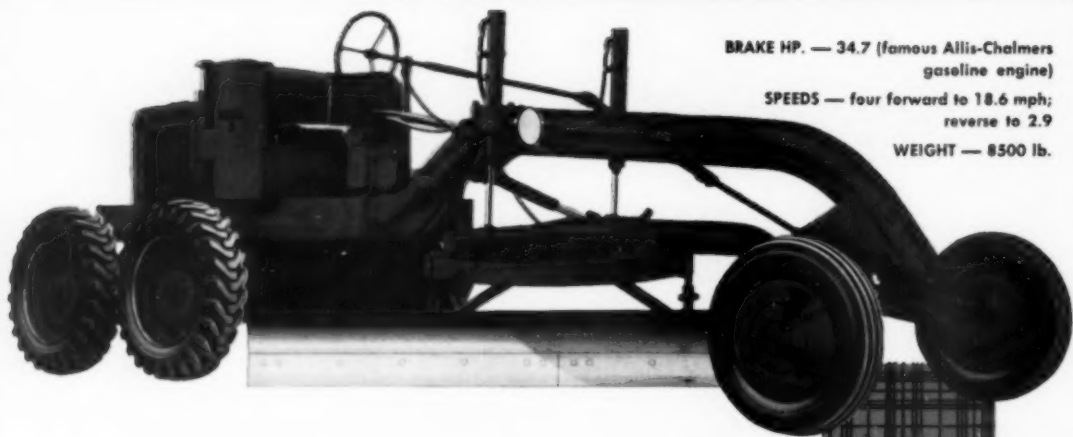


Roebling Prestressed Concrete Strand and its specially developed fitting which are available in a complete range of sizes from 5/8" to 1 7/16". With an inexpensive hydraulic ram, assemblies such as these can be brought to stress in a matter of minutes.

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BRAKE HP. — 34.7 (famous Allis-Chalmers gasoline engine)

SPEEDS — four forward to 18.6 mph;
reverse to 2.9

WEIGHT — 8500 lb.

only the *Allis-Chalmers* **model**



Does so many jobs at

Low first cost • Tandem drive • plus matched attachments

Here's a grader with power and capacity to do an outstanding job the year 'round on both construction and maintenance . . . yet it costs only one-third as much as large graders. The most important reason for this unequalled performance is sure-footed TANDEM DRIVE. This big grader-feature provides better traction, easier riding, smoother blading under *all* conditions . . . and it's *exclusive* with the Model D in this class.

What's more, with easily mounted, hydraulically controlled rear-end loader, scarifier, snowplow and windrow eliminator, there's almost no limit to the jobs it can handle with real savings. See your Allis-Chalmers dealer now and let him give you a working demonstration.

the newest, finest line on Earth!

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TRACTOR DIVISION • MILWAUKEE 1, U. S. A.



Builds Roads and Streets



Scarifies Toughest Surfaces



Slopes Banks



Cuts and Cleans Ditches



Strips Sod, Handles Terracing



**Finishes Between Forms,
Levels Sub-divisions**

so little cost

make it the biggest value of them ALL!



Grades Shoulders



Maintains Without Leaving Windrows



Works and Spreads Oil Mix



**Loads Surplus Dirt
or From Stockpiles**

**designed for your jobs!
built to take it!
easy to operate!
easy to service!**



Plows Snow



Loads Snow



use **MARION**
BODIES AND HOISTS
dump trailers for
haulage efficiency



MARION
BODIES AND HOISTS

Many Marion owners are purchasing additional Marion Dump Trailers. These owners know the extra benefits that can be expected from Marion equipment.

They know that these benefits mean dollars saved . . . because of greater load-carrying capacities, less maintenance cost and fewer man-hours per-ton payload.

Marion all-welded Trailer Bodies are constructed to withstand sagging or twisting when loads are uneven or extra heavy. Marion's Heavy-Duty Hoists operate with extremely low, even oil pressures . . . without high-surge points during any part of the lift.

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HIGHWAY and AIRPORT

JACKSON VIBRATORY PAVING TUBE

The JACKSON Paving Tube, which is quickly attached to any standard finisher, provides full width internal vibration through full depth of the slab. The harsher mixes are readily made plastic. Important savings in cement can be made, or important gains in compressive strength and durability achieved when no cement reduction is made. Spreading costs are reduced, finishing progress is much more rapid, complete compaction is accomplished and concrete is perfectly puddled at side-forms and joints. It is adaptable to slabs 6" to 24" thick and quickly adjustable from 10' to 25' widths, in the field. May also be attached to standard spreaders for vibrating the first course in thick slab construction. Write for complete details.



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Strikes off to any crown, undercuts at curb or side-form, works right up to and around manholes and other obstructions. With it center joints may be eliminated and full widths (up to 30') poured. Requires only two men on widest slab, due to strong tendency to propel itself. It's the only screed that can be rolled back on 4 rollers for second pass. Contractor has only to secure plank cut to proper length and crown to be set for any job. Powered by Jackson 1.25 KVA Portable Power Plant. Most productive, most versatile of all screeds. Write for details.

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Look at the w-i-d-t-h of the 625! The wide, curved cutting-edge lets you use your power where it counts — to cut and load. Less power is used to move material back in pan. *Result:* Loads in minimum time and distance with less tractive effort . . . Live boiling action into both bowl and apron gives full heaping load every trip — reduces cost per yard . . . Forced ejection with exceptionally large apron opening gives faster dumping and controlled spreading, with rate closely controlled by operator . . . Other **GAR WOOD** scrapers in 20, 14 and 12 cu. yd. heaped capacity.

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**Peoria, Ill. reduces maintenance cost
with *SOIL-CEMENT* streets**

1948—Peoria Ave. was the first street paved with soil-cement.



1949—Michigan Ave. was in the second year's program.



1950—35,000 sq. yd., including this stretch on Alice Ave.



1951—Paving on W. Gift St., part of 49,000 sq. yd. for year.

Like many cities, Peoria, Ill. spent thousands of dollars annually maintaining granular base residential streets. Yet because of continuing base failures these repairs proved to be temporary.

City officials sought a way to reduce this high cost. They found the answer in soil-cement.*

In 1948 they paved three blocks with soil-cement. Property owners, accustomed to ineffective repairs on dusty, potholed streets, watched operations critically. They liked what they saw.

Says Com. Pub. Wks. Ralph Metts: "We're swamped with petitions from property owners for soil-cement streets. It's difficult to keep up with them—even though property owners pay 75% of the cost. The city's 25% share is for intersections.

"In our long-range program we already have more than 160,000 sq. yd. of soil-cement streets. We plan at least 116,000 sq. yd. more in 1952."

Peoria thus joins scores of cities, counties and states enjoying economical, all-weather service from soil-cement roads and streets. Soil-cement paving is economical because most of the required material is soil already on the site. Construction procedures are fast and so simple that crews quickly master them. And records prove that maintenance costs are extremely low.

For additional information write for free literature, distributed only in the U. S. and Canada.

*Soil-cement pavement consists of a soil-cement base and bituminous surface.

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IT is cubic yards in the form that count — not batches per hour. On your general construction and building jobs the MultiFoote 27-E handles upwards to 50 cu. yds. an hour to the forms. The big 55 cu. ft. bucket and smooth operating controls at the bucket make it easy to divide or distribute the load as you want it with plenty of mix when and where you want it. On your floor jobs and housing jobs bucket clearance with level boom means time saved in placing concrete.

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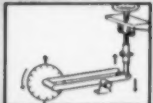
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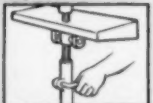
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Fastest mobile finisher made today. Screeds slung outside frame enable the Special to hug the forms eliminating swaying and weaving, permitting better surfacing.



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Of the six leading highway and airport contractors in Detroit five are using the new Flex-Plane super-portable Detroit Finisher—**three have already reordered additional machines.** This story is repeated wherever contractors have been exposed to the facts of this labor-saving, time-saving, quality-improving finisher.

The Detroit Special is maneuverability at its best. The built-in heavy-duty hydraulic transportation rig lifts the finisher off the forms and has it on its way to the next job in seconds! And improved gearing gives the Special extra speed on the forms.

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The Special carries advanced-design Flex-Plane reversible screeds that have in-

tegral curb offset, drop screed, crown change and disengaging devices plus an infinite range of adjustment to permit synchronization, counter-synchronization, parallel stroking, quarter parallel stroking, etc.

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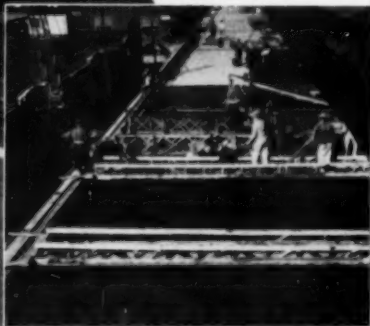
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Steel's "Blood Bank" needs your help



In normal times, steel's "blood bank" of iron and steel scrap is well stocked. But not this year. Increased steel production has cleaned out scrap yards—put steel mill furnaces on a hand-to-mouth diet of scrap.

Because scrap is the *lifeblood* of today's high steel production, your help in getting in the scrap is desperately needed.

This is why: About 750 pounds of scrap are needed to produce one ton of steel. With steel production now rated over 100 million tons a year, about 37 million tons of scrap will be required each year. It is urgently needed to meet military and civilian demands. Unless everyone pitches in there is danger that steel production may be cut in months to come.

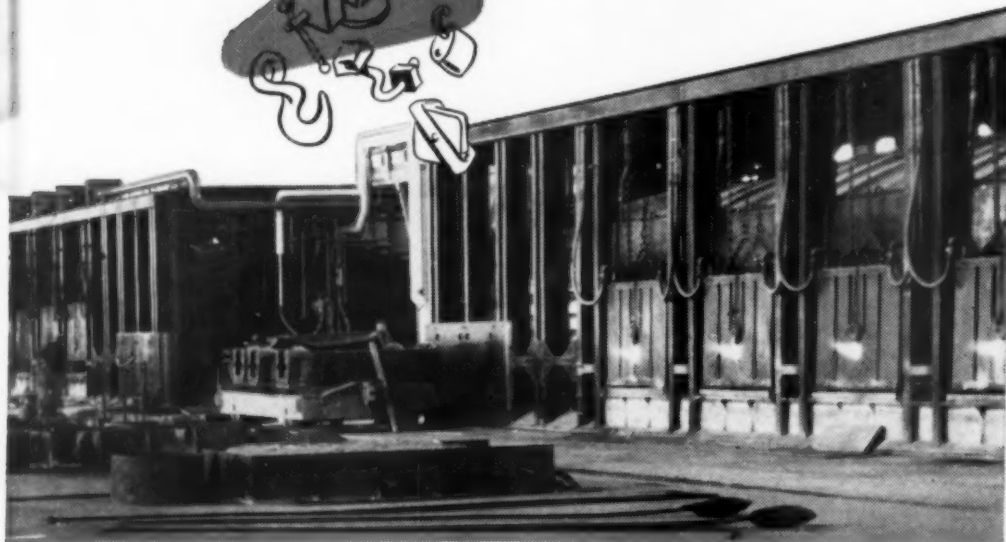
Pays in Cash Too

The price of scrap is another reason for you to help. You get a good cash return for your iron and steel scrap by selling now.

Take these two simple steps: Survey your maintenance shops, garages and storage yards for all worn-out or obsolete iron and steel parts and equipment; then call your local scrap dealer. But don't stop here. Make plans now to establish regular scrap collections.

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A Medium-Priced Motor Grader with a lot of Capacity....

ADAMS No. 312

**70 H. P. Full-
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• The new Adams Motor Grader No. 312 is made to order for municipalities and contractors who are looking for a good utility machine at a moderate price.

Here is a husky 70 hp. motor grader with all of the weight and performance-ability that you bought in heavy-duty machines several years ago. From deep ditch cutting to high bank sloping—scarifying, sub-grading, fine finishing, mixing, back-filling, snow plowing, etc.—the new Adams No. 312 will do a surprising amount of work with

real speed, efficiency and economy.

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GOOD YEAR

MORE TONS ARE HAULED ON GOODYEAR TIRES THAN ON ANY OTHER KIND

GRADING AND PAVING FOR LAKEWOOD:

One Year City

Contractors, city street officials and municipal planners will all find much to interest them in this scraper's-eye-view of a spectacular community development project

TWENTY miles southeast of Los Angeles, a city has been created from scratch in less than a year. It is a city bigger than Phoenix, Arizona, or Amarillo, Texas, was in 1940. It is a city with homes, schools, churches, and an ultra-modern shopping center. As of late 1950, it was a sugar beet farm. Today, homes line its fine streets, and G. Harry Rothberg, a salesman who never sold real estate in his life before, can look back at the consignment of \$50,000,000 worth of property to buyers in 6 months.

"I don't know how Harry did it," one associate remarked, "unless the dirt men helped. They overcame the prejudice of buying property on a fill."

In that chance remark lies the key to an interesting project, for soils engineering straight from the road-building business stepped in to solve a serious problem. The grading plan for Lakewood Park's homes called for practically all house foundations to be built on fill, and for almost all streets to be in cuts. And the bearing value everywhere has had to measure up to Los Angeles city specifications.

Modified Proctor densities of at least 90% are required under all actual building sites and street areas. Front and back lots are "stiffened" by moderate compaction, say three passes with a sheepsfoot roller where it takes six to develop 90% density.

In addition, the street areas will have 10 to 12 in. select material subbases and an asphalt penetration pavement. Street areas are to be handled by Los Angeles County road department forces.

Background Problems

The 3,500-acre tract where Lakewood Park's 17,120 homes are being built had some interesting conditions of particular concern to the owners. First of all, the tract was strictly agricultural. It had been plowed deep and the soil was loose. The builders were interested in putting up homes which would stand for years with little maintenance and overcome any prejudice against construction on filled ground.

Donald R. Warren Co., engineers

of Los Angeles, were called in as consultants. A study showed three principal types of soils: a sand with a dry weight of 106 lb. per cu. ft., optimum moisture 9%; a 116-lb. silt with optimum moisture at 14%, and a 124-lb. reddish sandy clay at 16% moisture. There was also a little black adobe topsoil.

On the basis of these studies, specifications were written around 90% density, and a field force was sent out to inspect and sample the work.

The first block of 7,000 homes went up in six months. Results looked good, and there was an absolute minimum of plaster cracking or street pavement failure.

Recently, operations again were in high gear. J. A. Thompson Co. of Los Angeles, subcontracted the 600,000

★ Where 17,000 new homes are being built in one of Nation's largest and fastest development projects





Yesterday Hundreds of blocks of homesites for Lakewood Park were completely undeveloped. Large scrapers moved 12,000 yd. per day

cu. yd. dirt job from Jack Stewart and Aetna Construction Co. builders for Lakewood Park Mutual Homes.

This is no ordinary real estate development. There are over 28 miles of city streets, with curb and gutter. There are 2,771 new homes in Thompson's present development, covering about 700 acres. Those houses are going in at the rate of 35 a day, and Thompson was given only 10 days' start before the other highly mechanized crews moved in. Thompson was in the middle. On one side, the builders were pushing him for space. On the other side, came soil technicians insisting on a dense job. Thompson gave them both what they asked for, at the rate of 12,000 cu. yd. per shift. Most of the earthmoving job was cleaned up this winter.

Fast Equipment

The big equipment spread, representing an investment of over \$550,000, was built around Wooldridge Terra Cobras and Caterpillar DW-

10's hauling 14 pay yards per load. The average haul, one way, was 2,500 feet, so Thompson assigned an even dozen Cobras to handle the enormous yardage.

To match the loading speed of this fast equipment in borrow areas, two Allis-Chalmers HD-19 pusher tractors with standard torque converter equipment were used to develop maximum loads. One Allis-Chalmers HD-15 and one Caterpillar D8 pulled Southwest sheepfoot rollers with three D8's on dozer work. Three No. 12 motor graders and five 1,800-ga. capacity water trucks completed the line-up.

From Thompson's point of view, the job has been anything but easy. Four drainage channels, 11 ft. deep and from 8 to 11 ft. wide, bottom measurement, took equipment down dangerously near the water table. Soil patterns were irregular, and the work had to be constantly adapted to them to get required densities. All three soil types required about the same rolling treatment. Careful moisture

control, with full respect to the soil type, was obtained before the rollers were turned loose.

Thompson's superintendent, Marvin McCoy, an old dirt stiff with years of experience, likes to do his long hauling first, but the job was so rushed that he never had time. The usual size of a building tract is 153 acres, so McCoy simply moved in started cutting and filling. Some of the cuts were as much as 5 ft. and fills 3 ft. All homes on the project must be set at a prescribed minimum elevation, referred to sea level. As a rule, the streets are slightly lower than the houses, and the concrete curbs and gutters are the principal features of the drainage plan.

A practical result of compaction care was to relieve the builders of a great deal of worry. Thompson's earthwork specifications called for him to finish the areas to within 0.1 ft. of grade. The areas have been so true and dense that when the equipment finished and the foundation excavating machinery came in, the operators usually could dig down a uniform 22 in. below the ground surface, without ever referring to other survey stakes. That excavation controls the final grade of the homes, but you can look down one of the lines for 500 ft. without seeing a single roof visibly out of line or grade. This proof that soil can be handled scientifically on a job of this kind has impressed many a skeptical buyer.

The street areas are being finished off with sheepfoot roller passes and a motor grader. Later on, after curbs and gutters are in, utilities companies will lay the gas, water, and other lines down the streets. These companies usually backfill by flooding. County road department forces will



Today Several thousand modern homes such as these are now completed and occupied in a city which did not exist a few short months ago



★ Thorough compaction of fill areas under laboratory control, plus exact final grading, produced elevations so accurate that foundation excavating equipment could work from the grade without stakes. Sprinklers kept soil at optimum, just as on a highway or airport grading job



★ Following completion of grading, trenching machines were used for house foundations, soil-pipe and utility installations



★ Average of 35 house foundations per day were poured with ready-mix, setting a fast pace for the grading contractor

let the trenches settle, then do a thorough job of sheepfoot rolling the entire street area to at least 90% density. Selected base material will be placed and compacted to 95% followed by a penetration asphalt macadam surface.

Mechanized Building

Lakewood Park is perhaps one of the most highly mechanized building jobs ever attempted. So well organized

are the various elements of each home that carpenters work up one side of a street and then come down the other, just to save a few steps. Ditches for soil pipe and water lines are cut in a few minutes by Model 95 Cleveland trenching machines. The foundation forms are prefabricated, numbered according to the seven basic house patterns, and handled in one package by Wagnermobile front end lifts. Concrete for at least 35 founda-

tions a day comes in by truck mixers from a local commercial plant. There have been cases where roofers were nailing down the shingles less than a week from the time Thompson's earthmoving units left the site. Materials, trucked in from Los Angeles, are unloaded on the site of each home without secondary storage.

Interesting Water System

One of the interesting aspects of



★ Submersible pumps which figured prominently in the drainage scheme for Lakewood Park are housed in "lid-proof" fenced areas (left), or under street pavement right), in which latter case the pump controls were protected against tinkering by housing as shown





★ Taking density samples on a fill area for Lakewood Park. Laboratory control of grading on this project was considered of prime importance

the Lakewood Park street system is the fact that new water lines, replacing the older type agricultural lines, had to be installed under the city streets. These new cast iron mains, of 4 to 12 in. diameter, carry 75-psi. pressure furnished partly by a storage reservoir and partly by 22 Byron Jackson Submersible pumps.

Because virtually every square foot of space was taken by house lots and shopping centers, many of the submersible pumps were installed in the ground under paved streets. These new type pumps are simple and dependable. There is no wet nursing of oil cups, packing glands, or grease fittings. And they are silent, a distinct advantage in a residential zone.

The old agricultural wells were deepened to about 1,100 ft. and several new ones were drilled to furnish this mushrooming new city.

City of Future

So many aspects of modern municipal planning entered into Lakewood Park that it can truly be called a city of the future. No multiple housing project ever built—not even Long Island's Levittown, Parklambra Manor in Los Angeles, or Peter Cooper Village in New York—is considered as modern.

A 153-acre tract is set aside for a shopping center. There will be supermarkets, department stores, small places of business. City traffic flows have been studied, and at Lakewood Park there will be tunnels for underground truck deliveries to keep heavy traffic off the streets. For every square foot of merchant selling space there will be 2½ square feet of off-street free parking. The strong points and mistakes of every modern shopping center in the nation entered into this traffic study.

One of the most outstanding fea-

tures is the way in which the primary shopping area has been arranged. A wide shopping walk lined with stores on either side stretches for more than a quarter of a mile without interruption by cross streets or vehicular traffic of any kind.

In other areas of the center will be supermarkets, office buildings, a secondary shopping area including automobile sales and service, theatres and amusement areas, bowling alleys, swimming pools, tennis courts, a complete hospital center, even civic buildings.

Altogether, the property covers about 10 square miles of one of the last ranch holdings of Montana Land Company. Around the turn of the century it was a vast expanse of willows in the Los Angeles River delta.

Considering the one-time nature of the property, modern equipment and soils engineering have wrought an almost unbelievable change in this part of southern California.

Bibliography of Cement And Concrete

By Floyd D. Slate, Ph.D.

Purdue University Engineering Experiment Station has published "Comprehensive Bibliography of Cement and Concrete 1925-1947," by Floyd D. Slate, Ph.D. This 491 page bibliography contains over 40,000 references which represent substantially the world's scientific literature in the field of cement and concrete. Every effort has been made to make this bibliography as complete and useful as possible.

The following subdivisions illustrate the variety of subjects covered: History; Bibliography; Handbooks and Reference Books; Reviews and Symposia; Cement; Pozzolana; Admixtures; Aggregates; Concrete;

Mortar and Concrete Coatings; Misc. Cement Compositions; Reinforced Concrete; Architectural Concrete; Light-weight Concrete; Ready-mixed Concrete; Soil Cement; Pre-cast Concrete; Processes for Manufacture of Concrete; Winter Concreting; Forms; Construction; etc.

A partial list of works consulted in the compilation includes Chemical Abstracts, British Chemical Abstracts, Chemisches Zentralblatt, Engineering Index, Industrial Arts Index, Journal of the American Concrete Institute, Proceedings of the American Society for Testing Materials, Transactions of the American Society of Civil Engineers, Zement by F. Wecke, Handbuch der Zementliteratur, by F. Wecke, and Das Schrifttum über den Baustoff Beton, seine Herstellung und Verarbeitung by T. von Rothe.

Price is \$5.00 for a lithoprinted copy with plastic binding. Please address requests for copies to Director, Engineering Experiment Station, Purdue University, Lafayette, Ind.; remittance payable to Purdue University.

Carl Franks Appointed Executive V. P. Portland Cement Association

Carl D. Franks, Vice President for Promotion of the Portland Cement Association since 1948, was appointed to the newly created position of Executive Vice President, according to an announcement by Smith W. Storey, association chairman.

As Executive Vice President, Mr. Franks' responsibilities will include exercising the duties of the President of the Association in that official's absence. He will also have such other duties as may be assigned to him by the President or the Board of Directors. The position of PCA President, vacant since the death of Frank T. Sheets last November, has not yet been filled.

Mr. Franks, a Purdue graduate in civil engineering, has been with PCA since it was established with main offices in Chicago in 1916.



★ Carl D. Franks

Turnpikes Through the Wheat Fields

The tendency to resort to turnpikes to solve highway problems has reached some kind of a new "high" in the proposal to build a network of toll roads in Oklahoma, Texas, Kansas and Missouri.

These states have relatively little traffic congestion, but rather a highly dispersed inter-city, inter-town and farm-to-market traffic. Their real problem is to bring up the standard of the entire highway network on which thousands of farming communities depend. Due to the very large mileage of roads in relation to population and to revenues, the plains states face a very serious and widespread problem of highway obsolescence; a majority of the state system mileage consists of roads which are sub-standard in safety, traffic capacity or roadbed condition.

In Oklahoma, the state government leaders should turn their attention to the No. 1 road problem which is to survey the needs of the state as a whole, and modernize their legislation to take roads out of the pork barrel system which still scatters much of the available road funds.

In Missouri, where roads have been starving to death on the nation's lowest gas tax of two cents (just now raised to three cents), the legislature should consider sound and equitable means of doubling highway revenues and modernizing the highway system on a priority basis of traffic and safety needs.

In all four of these states, we venture that the proposed turnpikes will do little or nothing for 75% to

90% of the citizens. The projects could do serious harm if for no other reason than that they will divert attention from the real problem.

Each state has at its command the new scientific tool of measuring the over-all highway needs of a state: the sufficiency rating system. The trend in this country inevitably is towards the greater use of engineering techniques with less dependence upon politics, in planning road programs. With highway transportation at such a high level—and the economic stakes so great—citizens can no longer tolerate the luxury of ill-planned roads.

Will these turnpikes attract enough patronage to assure retirement of bonds through toll receipts? There is an established survey procedure for answering this question. Investment bankers should demand hard figures here, coupled with the assurance that proper legislation will be enacted. While traffic flow has grown spectacularly throughout the nation, some recent or current toll projects have presented a none too encouraging picture to financial men.

Rather than no increase in road programs in the wheat belt, let's have turnpikes, if the public is willing to pay the high per-mile cost of using them. But we still say that the main problem is to step up arterial road modernization programs on a *state-wide* basis in the Middlewest and everywhere in this country. Highway transportation, which today represents one-seventh of our national economy, can be no more efficient than the highway network as a whole.

How Ridiculous Can a Legislature Get?

An example of thinking on the part of a state legislature which is doing road users no good, occurred last year in South Dakota. The state's legislature appropriated \$3 million of additional funds compared with the previous year for road development. This was \$2 million less than the sum desired by the State Highway Department and recommended by the Good Roads Association for projected work. The Legislature also turned down a tax bill which would have raised badly needed additional funds.

Then this august body turned around and increased the highway difficulties of the state by adding nearly 200 miles of routes to the State Trunk System. These routes need an immediate expenditure of over \$5.3 million for surface repairs or renewal, widening and other improvements to fit them for their traffic and protect the existing investment.

Apparently the South Dakota Good Roads Association has a real job to do among the voters.

IT COSTS LESS TO BUILD GOOD ROADS THAN TO HAVE POOR ROADS

Sufficiency Ratings

in Relation to Tolerable Standards and Priorities

Herein is outlined a development which many highway leaders believe to be the most important one in the highway field today. By reinforcing emotional appeals with scientific analysis, highway programs can be more soundly planned in the public interest and will be more readily acceptable to legislative bodies wrestling with highway financing problems.—Editors

By C. E. Fritts

Vice President for Engineering,
Automotive Safety Foundation,
Washington, D. C.

THE nation's heavy backlog of highway needs, the search for means of coping with it, and the present complexity of the situation, all have brought sharply into focus the need for more scientific methods of highway evaluation.

Gradual assembly of facts and research continually place more tools for that purpose in the hands of engineers and administrators. As in the building of a machine, no one tool is the universal implement. A variety is required with each one designed to accomplish its purpose most efficiently. Tolerable standards, design standards, sufficiency ratings and a number of factors affecting priority of work are all important tools complementing each other in the job of building a sound highway program.

Any measurement of needs must be accomplished through the use of proper gauges, which set a target to be aimed at in the measurement process. Highway standards become the basic element in measurement methods. They are the engineering yardstick by which our evaluation of what is needed or desirable is determined.

First, Objectives

Before going to the specific subject of tolerable standards, I think we must keep in mind a few of the more important objectives to be achieved in the measurement of highway needs.

First, it is essential that needs be accurately determined in order to establish the rate or level at which highway development should proceed. Second, the needs must be known in order

that an adequate and equitable fiscal policy can be established. And third, the needs must be measured in order to place proper balance and priority into the execution of the program.

For purposes of measurement, the needs of the highway are broken up into three major components. First is the backlog of sub-standard facilities which must be improved to higher standards to meet ever increasing demands of traffic use; second are the requirements for replacement of facilities as they wear out; and third are the requirements for maintenance. Highway standards have a very direct bearing on each of those three basic elements of need but in the measurement process they affect most directly the items of construction and replacement.

The standards of design for highways as developed by AASHO reflect the type of highways that are desirable, economical and most efficient in serving transportation needs. When roads are improved to standards lower than those prescribed in AASHO policies, some efficiency and safety are sacrificed.

But the sheer magnitude of bringing the whole highway plant up to such standards dictates that we be completely realistic in our statements of necessity. To do that we must say that we will have to continue in use those facilities which will not provide completely modern service but yet will give reasonably satisfactory service. We must extract the greatest possible degree of service from existing facilities. The present investment must be used to maximum advantage.

Thus, recognizing the economic aspects, it becomes necessary to establish some cut-off point where it can be said that roads which do not meet certain standards for given conditions of traffic, terrain, service and safety must be improved to a higher standard.

It is this realistic, practical economic approach that brings into being the use of tolerable standards.

Fundamentally, the tolerable standard is a completely defensible criterion, every element of which is set at the lowest point on the yardstick permissible under today's highway transportation requirements. It is not a point determined by funds available to a job but rather a point used as a means of isolating and identifying those sections of the several systems which are so far below design standards that their need of improvement is unquestioned.

In setting the tolerable standards, past design practice and resulting investment must be evaluated. The service performance of existing facilities has to be examined in the light of maintenance costs, accident experience, capacity in terms of operating speeds and other service characteristics. Traffic volumes and vehicle types in use must be considered. In the final analysis the tolerable standards are set by informed engineering judgment with the objective of defining the existing investment that we can continue in use without creating:

1. Congestion detrimental to the public welfare.
2. Uneconomical time losses because of low operating speeds.
3. Unreasonable accident rates.
4. Unreasonable maintenance costs.
5. Uneconomical operations resulting from improper surfaces, excessive grades, circuitous routes.

In the practical application of tolerable standards, consideration must be given to the economics of the state and the probable impact of its economic status upon highway development.

Many Questions

The economic influence extends to design standards as well as tolerable standards. It is most important with

Paper presented in a symposium on Sufficiency Rating procedures, Highway Research Board 51st Annual Meeting, Washington, D. C., Jan. 13-18, 1952.

relation to systems other than major arteries. Uses and service importance of secondary systems where traffic volume is not significant pose the greatest problem.

Questions always arise, such as

1. At what point is a dustless surface justifiable?

2. What minimum width will provide reasonable service—16 feet, 18 feet, or maybe 12 feet?

3. What degree of improvement has the local economy been able to support in the past?

These and many other questions arise as design and tolerable standards are developed in the measurement of highway needs. They are finally resolved through the application of the best available engineering analysis and experience. The AASHO design policies form a solid base for determination where they are applicable. Decisions that have to be made for secondary and urban facilities do not rest on such a solid body of fact.

In many areas there is need for research which will give more positive guidance in the economics of highway development. Some of these areas are:

1. A better evaluation of the relation of design elements to safety of operation. What are the lowest standards of highway improvement we can accept without increasing the accident rate?

2. What are the lowest acceptable standards that can be used which will result in economical maintenance costs?

3. What is the optimum standard that can be used to produce the lowest overall transportation cost considering jointly vehicle operation and highway costs?

The sufficiency rating procedures do not answer these questions. In their

present stage of development rating procedures cannot in themselves determine what is tolerable and what is not. However, they are a valuable corollary to the tolerable standards in the measurement of needs. In their use on routes of considerable traffic significance they provide a measure of relativity which is badly needed.

It is to be hoped that, as research and study continue, it will become possible to correlate rating values and standards sufficiently to permit selection of a certain rating as a tolerable level for a particular system or for a given set of conditions.

How the ratings can now supplement the tolerable standards and aid in determining priority of work may be indicated by a chart on which are shown the basic elements of the measurement process. It represents a typical route or given system of roads. By the use of tolerable standards, the current backlog of substandard sections are measured. In this example, 50 percent of the mileage was found to be below tolerable standards as adopted. This sample is not typical of most highway routes in that it shows a poorer than average condition.

Replacements Vital

But as a program is developed to eliminate the measured backlog which must be carried out over a period of years, the other 50 percent now considered adequate will begin to wear out, become obsolete and otherwise have to be replaced. Thus the needs program must incorporate annual replacement costs.

In addition, the annual maintenance

requirements must be added to the total to completely portray needs.

The cutoff point to distinguish between the current backlog and presently tolerable facilities determine the point or percentage shown on the upper line. If modern design standards were used as a gauge, we would find the percentage of deficient mileage to be 80 percent or 90 percent. That amount of rehabilitation would be most difficult to achieve in light of the present progress and highway support.

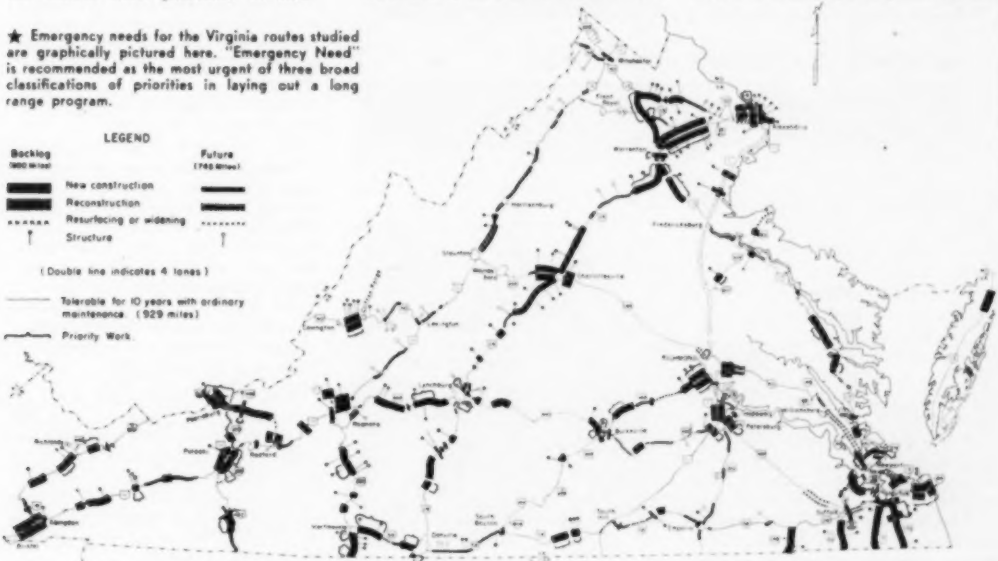
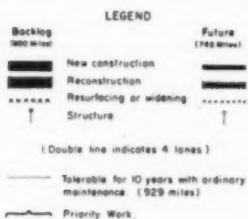
If the tolerable standards are lowered beyond defensible values, we simply increase the mileage of replacement and move in a direction of merely sustaining our highway at its present inefficiency and lack of capacity.

The lower scale indicates how, at the present stage of its development, the sufficiency rating device supplements the tolerable standard approach. The tolerable standard measurement fixes an economical and reasonable objective in the most simple and universally applicable manner. When the sufficiency rating method is predicated on and correlated with tolerable standards, greater consistency should result.

An impartial priority program requires a uniform approach which, in general, sufficiency ratings can help to obtain. Practical procedures must be established and adhered to except for most unusual causes. Yet final selections determined by such procedures still will be subject to tests of engineering judgment, financial feasibility, changing conditions, and emergencies.

It is doubtful whether any formula can ever satisfy automatically all conditions affecting priority determina-

★ Emergency needs for the Virginia routes studied are graphically pictured here. "Emergency Need" is recommended as the most urgent of three broad classifications of priorities in laying out a long range program.



tion by highway administrators. However, the improved guides represented by rating procedures are helpful in making a comparative analysis of the relative merits of needed work which has been determined through the application of tolerable standards. Thus final decisions on priority can be narrowed to remaining considerations of feasibility which cannot be reflected in techniques so far developed.

Our experience in cooperation with the Bureau of Public Roads and several states and in the application of rating procedures to priority analysis most recently in Virginia, leads us to the conclusion that among the considerations which affect priority, in addition to the sufficiency ratings themselves, are the following:

1. Effect of highway classification.

The predominant functional classification of the highway must be considered in scheduling work. It is well known that traffic volumes alone do not determine the classification plan. It is clear that in many cases a sufficiency rating of 50, for example, on each of two routes having equal traffic volumes would not necessarily imply equal priority. One of these

routes might be rendering most important interstate service between major cities and the other might be classified as a link between smaller local market centers. All other things being equal, it seems obvious that the former should have priority.

2. Need for geographic distribution.

The priority plan must provide for some measure of geographic distribution of annual work in order to have a reasonable balance of work load on available personnel and to provide for improvement of service in all parts of the state.

3. Need for continuity and consistency of route development.

Gaps in continuity of routes, development of a fully integrated system sometimes involving new mileages not now existing, and short sections of poor highway greatly inconsistent with the balance of the route are special factors which must be considered and for which current rating plans do not account.

4. Effect of rural-urban and urban-urban relationships.

There are fundamental problems of priority of fund allocations between rural and urban work which are not

easily resolved. And when these decisions are reached, the cities themselves generally have the authority to alter them. For example, a top priority urban-state project may be deferred for many years per capita financing of the city's share. Thus a state-wide determination of relative priorities of urban work among all cities may be largely academic in actual practice. Within a given jurisdiction, however, great benefits can accrue by careful priority determination of specific needs, in which process a good urban sufficiency rating plan can play its part.

Urban Influence

Traffic congestion within a city will also have its effect on purely rural needs in cases where rural bypasses may be required or rural connections are needed for newly-located urban routes. Importance of such work would not necessarily be reflected in current rating techniques.

5. Effect of the benefit-cost ratio.

The nature of the improvement required, rather than the section's present sufficiency, obviously controls its cost. Many methods of determining benefits have been worked out, and benefit-cost ratios determined.

Those projects having highest benefits per unit of cost should receive priority consideration. Perhaps one of the factors affecting priority, then, could be a sufficiency rating point-cost ratio if it can be established that changes in rating values are commensurate with benefits.

One of the benefits to be obtained from a given expenditure is improvement of as large a mileage as possible. Consequently, low cost-per-mile work must be considered along with other factors.

6. Relations between backlog, future and emergency needs.

If a complete 10 to 20 year program is being proposed, those projects defined by tolerable standards as representing the backlog of need should generally receive higher priority than those which will accrue in the future. However, changing economic conditions, or unforeseen emergencies may force alteration of the picture, and the priority plan should remain flexible enough to include such conditions.

7. Time and personnel.

Time required to prepare plans, secure agreements, obtain rights-of-way and, currently, to obtain necessary materials and personnel will have an appreciable effect on selection of projects for annual programs. Presumably these are relatively short-range problems which more advance planning might overcome.

CURRENT BACKLOG - SUBSTANDARD FACILITIES



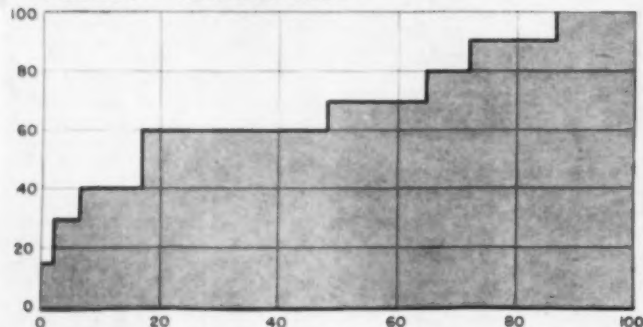
FUTURE REPLACEMENT NEEDS



MAINTENANCE & ADMINISTRATIVE NEEDS



PRIORITY & RELATIVE NEEDS



★ Basic elements in measurements of needs

8. *Over-riding importance of certain highway elements.*

The elements of condition, service and safety making up the combined sufficiency rating are of course rated individually. The priority plan should make use of the ratings by some means of advancing the early scheduling of those sections with very low

ratings in any one of the three general categories. While it is recognized that factors producing a low service rating also may produce a low safety rating, this is not always true—particularly in the element of condition. Again, such matters should be correlated with tolerable standards in order to insure early consideration of such

very intolerable features as, for example, width of a two-lane pavement as much as six or eight feet below standard, or incipient failure of the surface even though all other road features may be satisfactory.

Conclusion

Highway needs must first be measured by reference to sound design standards and tolerable standards which seek to define the limits of elements below which highway service is intolerable. Sufficiency ratings greatly aid in this process, especially in borderline cases where combinations of conditions are difficult to define more precisely and individual judgment needs more scientific guidance.

But in a long-range program, the borderline case may soon move to the unquestioned backlog of need. The ratings are found, then, to be primarily a major tool in analyzing priority and developing schedules of work.

There are, however, a number of other factors which also affect the priority rating. They should have equal consideration with the sufficiency rating before annual priorities are set.

There is little to gain from making fine distinctions between the priorities of different highway projects, no matter how the relative merits may be derived. A complete 10 to 20 year program needs only to divide the work into perhaps three to 10 manageable groups. Within reasonable priority groupings, there is often small choice of one project over another.

With continuing research in economic evaluation and measurement of needs and in the job of putting first things first, the highway engineer is being given improved tools to do his job, and he will continually strive to use them properly.

Western Highway Meeting Seattle June 5-7

The Western Association of State Highway Officials will hold its 31st annual conference at the Olympic Hotel, Seattle, Washington, June 5, 6 and 7. William C. Pedersen of the Washington Department of Highways is program chairman. A yacht trip to inspect major Puget Sound bridges and the Naval shipyard at Bremerton is planned in connection.

Harvey Whipple, secretary of the American Concrete Institute since 1919 and treasurer since 1921, has been named editorial consultant to that organization by its Board of Direction. Fred F. Van Atta, assistant secretary since 1946, is appointed acting secretary-treasurer.

Virginia's Busiest Routes Subject of "Need Study"

APIONEER "sufficiency rating" study shows that it will require an annual construction and maintenance program of \$14.5 to \$25 million for the next 10 years—if the Commonwealth of Virginia would overcome many deficiencies which exist on 2,475 miles or the "busiest 3%" of primary rural roads. From \$6.8 to \$9.5 million more would be needed yearly for extensions through cities.

These recommendations are incorporated in a 66-page engineering study report recently completed in Virginia to determine minimum requirements essential to sustain highway transportation at reasonable levels of efficiency and safety during the national defense period.

The higher cost estimates are for a normal program, which the report strongly recommends as being carried out wherever feasible. The lower figures are for the minimum program which would have to be carried out during a period of shortages of manpower, materials, and equipment.

The study, financed jointly by the U.S. Bureau of Public Roads and Virginia Department of Highways, was made by the Automotive Safety Foundation, of Washington, a non-profit corporation devoted to development of safety and efficiency in highway transportation. Pyke Johnson, president of ASF, formally presented the report to General James A. Anderson, commissioner of the Virginia Department of Highways, in special exercises held in an auditorium in Richmond. The data will help in determining improvement priorities and bring the state's overall road needs into better perspective.

Details of the published report, entitled "Highway Needs in the Emergency, an Engineering Appraisal of Virginia's Principal Roads and Streets," were reviewed by Col. Carl E. Fritts, ASF's vice-president for engineering.

Others speaking briefly were J. P.

Buckley, chief engineer, highway division, and James O. Granum, highway engineer of the Foundation; and C. S. Mullen, chief engineer, Burton Marye, Jr., assistant chief engineer, and Kenneth G. McWane, traffic and planning engineer for Virginia.

Backlog of Need

The study pointed out that backlog of needs had accumulated on 800 of the 2,475 miles of rural highways; that 746 miles will become deficient during the next decade; and that 929 miles will remain tolerable during the 10-year period.

A Sufficiency Rating method was employed to inventory, mile by mile, the structural condition, ability to handle traffic, and safety elements. Detailed needs were determined by the use of "tolerable standards," which were developed to establish minimum conditions under which transportation service can be maintained. Each route was studied in detail, to measure its adequacy, to find economically justified improvements which normally would be made, and finally to indicate a minimum program necessary to sustain transportation during the emergency period, set at 10 years.

An interim report was published on June 30, 1951, to form a basis for discussion of the appraisal techniques. Preliminary findings were presented on U.S. Highway 29, which runs 244 miles in a southwesterly direction from the District of Columbia line to the North Carolina boundary.

Special engineers of the U.S. Bureau of Public Roads supplied aid to all technical aspects of the study, and representatives of the U.S. Department of Defense assisted in relating the requirements of the national emergency to the Virginia highway system. Civilian defense aspects of the study were reviewed with Federal and Virginia civilian defense authorities.



★ Front and rear views of the brush-fighting machine in action on the King Ranch in Texas

Contractors Eye Big Brush Control Unit

NEW applications of the combined power of two paired tractors are coming thick and fast these days. Contractors will be interested in the latest, pictured here. These scenes show a special brush-fighting "juggernaut," credited with working 3,800 acres of dense mesquite and underbrush in 1,000 hours of operation on the big King Ranch in southern Texas. Contractors with clearing jobs for highway right of way, airport or other projects may see opportunities for

similar applications—or perceive entirely different money-making uses for a machine of this general nature.

The unit consists of two Caterpillar D8 tractors with combined 270 hp. and 65,000 lb. drawbar pull, so framed together as to give high, wide clearance area underneath ($13\frac{1}{2}' \times 3'$). High clearance was obtained by placing an additional final drive bullgear over the regular one, and making other mechanical changes. Two equipment dealers did the job.

Extending in the back is a heavy root plow with a horizontal blade drawn along under the ground surface. In front is a special 7-ton "funnel dozer" (Wm. K. Holt), composed of two halves of a standard angling-type dozer blade mounted as pictured with two large knock-down bars or pipes in front.

The front end shears brush at the groundline. The plow, when needed, cuts roots and small stumps below the "bud ring," effectively killing such growths.

The machine represents a solution for the King Ranch based on years of costly experience battling with the tough, wirey brush of the region. The long-range brush control program of this and other ranches is aimed at eliminating noxious shrubs and other ground cover which steal sunlight from grass required for maximum

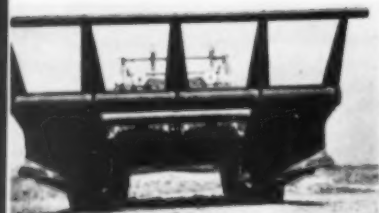
cattle pasturage and range land productivity. The machine cuts a 16 ft. swath, uses $2\frac{1}{2}$ to 3 gallons of diesel fuel per acre of clearing. Felled brush is left in place to add humus and protect the soil until the native grass can reseed itself.

Reports on Frost Action

"Frost Action in Roads and Airfields: A Review of the Literature, 1765-1951," by Special Report No. 1, by A. W. Johnson. Contains comprehensive review of the important literature on frost action published during the past two centuries. For practicing highway engineers as well as engineers and scientists engaged in frost-phenomena research, the 300-page publication contains 241 figures, \$3.00 per copy.

"Frost Action in Soils: A Symposium," Special Report No. 2, which contains 38 technical papers presented at the 30th Annual meeting of the Highway Research Board, on (1) Climate and Distribution of Soil; (2) Soil Temperature and Thermal Properties of Soils; (3) Soil Moisture and Soil Movement; (4) Basic Data Pertaining to Frost Action; (5) Frost Action and Spring Breakup; (6) Remedies and Treatment; and (7) Needed Research Pertaining to Frost Action. 394 pages, \$3.75 per copy.

For copy of either report send amount designated to the Highway Research Board, 2101 Constitution Ave., Washington 25, D. C. Add 30c per report for foreign postage.



★ Mechanical details: heavy horizontal root shearing blade, working underground; funnel-shaped front design; high clearance, permitting machine to ride high over brush, to save power use; and special overhead framing and cable control units, for raising and lowering dozer blades and root plow

Conclusions from Compaction Studies on Clayey Sands

Soil Compaction Investigation Report No. 2, Technical Memorandum No. 3-271, Corps of Engineers, U. S. Army, Mississippi River Commission, U. S. Waterways Experiment Station, Vicksburg, Mississippi, July 1949. Highway Research Abstracts, Washington, D. C., October, 1950.

This report is the second of a series to be published on various studies made during a comprehensive investigation of soil compaction. The first of the series was reported in Highway Research Abstracts, November 1949.

Five types of compaction equipment were used. They were: (1) 34,500 lb. D-8 tractor with contact pressure of about 8 psi. (2) Double drum American Steelworks Model AD-132 oscillating sheepsfoot roller having a 60 in. diameter drum and four 7-in. long, 7 sq. in. feet in a row and loaded with Baroid to produce foot pressures of 250-, 500-, and 750-psi. with one row of feet in contact with the ground. (3) 10,000 lb. wheel load (rear wheels of DW-10 motorized tractor) tire inflation pressure 60 psi. Contact pressure 64 psi. Contact area 155 sq. in. (4) 20,000 lb. wheel load (Model Super C Tournapull) tire inflation pressure 55 psi. Contact pressure 65 psi. Contact area 308 sq. in. (5) 40,000 lb. wheel load (32 cu. yd. Tournapull) tire inflation pressure 57 psi. Contact pressure 69 psi. Contact area 580 sq. in.

The soil was described as a silty clay consisting of 8 percent sand, 65 percent silt and 27 percent clay sizes. It had a L.L. of 37, P.I. of 14 and Sp. Gr. of 2.72. The maximum density (AASHO) was 105.3 and (AASHO modified) 116.8 and optimum water content of 17.9 (AASHO) and 14.8 (AASHO mod.) CBR values, unsoaked condition at optimum and maximum density were 11 and 65 percent respectively for the two compactive efforts.

The report presented the following summary and conclusions for the silty clay:

a. The following maximum dry densities, expressed as a percentage of modified AASHO density, were obtained in fills built in 6-in. lifts, with six passes of the compaction equipment.

10,000-lb. wheel load.....	92-94%
20,000-lb. wheel load.....	92-93%
40,000-lb. wheel load.....	93-94%

250-psi sheepsfoot roller.....	92%
500-psi sheepsfoot roller.....	91-92%
750-psi sheepsfoot roller.....	91-92%

A limited amount of data indicate that higher densities were obtained by additional passes of the 20,000-lb. wheel load. The sheepsfoot roller did not walk out with an increasing number of passes.

b. Two passes of the 34,500-lb. tractor obtained 86-88 percent of modified AASHO density.

c. The optimum water content developed by six passes of the compaction equipment is 2 to 3 percentage points higher than that developed by a laboratory effort producing the same maximum density. The shapes of the field and dynamic laboratory compaction curves are similar; however, the field curve is shifted 2 to 3 percentage points nearer the zero air voids curve. Thus, at equal densities the field-compacted soil has a higher water content and a higher degree of saturation.

d. A comparison of the optimum water contents as developed by six passes of the sheepsfoot and rubber-tired rollers with the optimum water content as developed in the laboratory by standard AASHO compaction is shown in the following tabulation:

Compactive Effort	Optimum Water Content
Standard AASHO	17.9
250-psi. sheepsfoot	19.1
500-psi. sheepsfoot	18.5
750-psi. sheepsfoot	19.0
10,000-lb. wheel load	19.2
20,000-lb. wheel load	19.5
40,000-lb. wheel load	19.1

e. Increasing roller weights did not result in increased maximum densities. It is possible, in the case of the sheepsfoot rollers that, due to the varying depths of penetration of the feet, little or no increase in contact pressure was actually obtained with increased roller weight. The rubber-tired equip-

ment had a practically constant contact pressure, which is believed to account for the fact that higher densities did not result from the use of heavier equipment.

f. It has been indicated by this test that, generally, an appreciable difference exists in the CBR of a specimen compacted by field equipment and a specimen compacted by conventional laboratory methods, even though the specimens being compared have identical water contents and densities. The reason is that even though the water contents and densities are equal the points being compared are at different relative positions on the compaction curves. Thus, it follows that the CBR, as determined by tests on undisturbed samples or field in-place tests, are not predicted satisfactorily from laboratory tests performed on material compacted in molds by conventional methods of static or dynamic compaction.

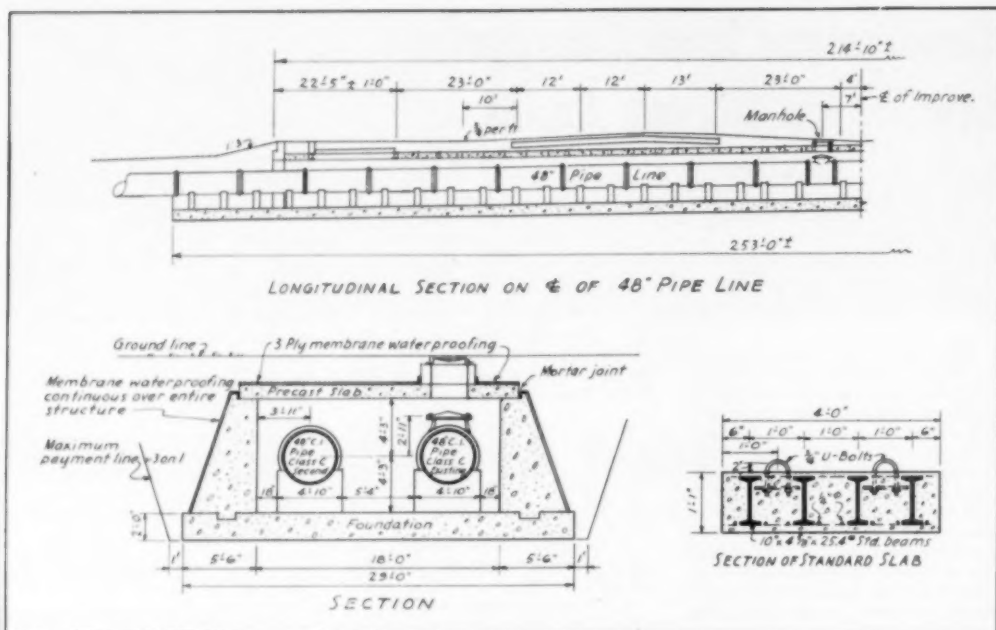
g. For this soil, at a given water content, the highest CBR is produced by the compactive effort for which the given water content is the optimum. Over compaction reduces the CBR value.

h. The maximum CBR of soaked statically compacted specimens occurred at molding water contents 1 to 3 percent higher than optimum.

i. The CBR penetration curves for material compacted by sheepsfoot and rubber-tired rollers are very similar. However, the CBR penetration curves from material compacted in the field are not predominantly similar to either one or the other groups of curves obtained from dynamic or static compaction in the laboratory.

j. The shear strength as determined by triaxial compression tests for unsoaked samples at the same water content and density is practically the same for samples compacted in the field or in the laboratory by dynamic compaction. Samples statically compacted in the laboratory also had about the same shear strength as in the field samples, except at the highest lateral load tested ($\sigma_3 = 3.0$ tons per sq. ft.) when the strength was somewhat lower.

k. For a design water content of approximately 16 percent, the moduli of deformation are approximately equal for dynamic and static compaction in the laboratory and for field compaction. At the water contents close to the field optimum of 19 percent, the moduli of deformation for rubber-tired and sheepsfoot rollers are nearly equal and are better approximated by statically compacted specimens than by dynamically compacted specimens. The latter had a modulus of deformation approximately 50 percent less than the specimens compacted by other methods.



★ Some of the structural details of the conduit box

Culvert with Removable Roof Takes Conduit under Thruway

AN 18' x 8½' x 253' concrete box culvert with a removable top was constructed recently in grading for the Albany cut-off section of the Catskill Thruway.

This unusual structure was designed to carry a high-pressure water supply conduit and a "spare" second conduit under the Thruway, in such a manner that the conduit will be open

to inspection at all times and also that minimum damage and repair cost would be incurred to conduit and pavement in event of a pressure break. The conduit is part of Albany's water supply system.

Each 48-in. diameter cast iron pressure line is carried on a row of concrete cradles. The roof consists of precast reinforced concrete slabs, each

4 ft. wide, slabs being 15 in. in depth under the main roadway and 13 in. at other locations. Top of the slab is located slightly below the ground line. The concrete roadway pavements are separated from the roof slabs by a granular base course.

The structure is part of the grading contract executed by A. Stewart Collins, Roger Dormandy was the engineer in charge.

Houghton Elected Chairman. R. D. Houghton, president Rice Pump & Machine Co., Grafton, Wis., has been elected chairman of the board of directors of the Contractors Pump Bureau, an affiliation of the Associated General Contractors of America.

★ Two views of the conduit underpass during construction





CENTRAL COLUMN



COLUMNS ALONG 13TH STREET



BENT WITH BRACKET

★ Sketches depicting some of the variations in streamlined bent and deck design planned for various parts of the ultimate viaduct system

DESIGNING WORLD'S LONGEST All-Welded Highway Structure

Contractor at work on first link of San Francisco's \$15,000,-000 Division Street Interchange. This article discusses economics of all-welded design, special analysis steel requirement, and problems of control of weld quality for thick plates involved.

By Wendell F. Pond

Associate Bridge Engineer, California
Division of Highways, Sacramento

IN July of last year construction was started on the first unit of what will eventually be the world's largest all welded highway structure. Located in downtown San Francisco and known as the Division Street Interchange, it will have the primary function of connecting California's Bayshore Freeway with the San Francisco-Oakland Bay Bridge and will also serve as an interchange for the distribution of local traffic.

Total cost of the interchange will be approximately \$15,000,000 and will be financed by gas tax fund receipts. At present it is planned that construction will be divided into five major portions with a total time of construction of about five years.

The first contract to be let was for the 9th and 10th Street Connections (shown cross-hatched in the accompanying Site Map.) This unit will extend Bayshore Freeway from the terminus of an adjacent grading contract at 17th Street to the intersections of Bryant Street with 9th and 10th Streets. Thus, traffic entering San Francisco from the south will be carried on a high-speed freeway to within four blocks of the Bay Bridge approach. The portions of the interchange that are to be constructed under later contracts will be equally usable and will be put into service as soon as completed.

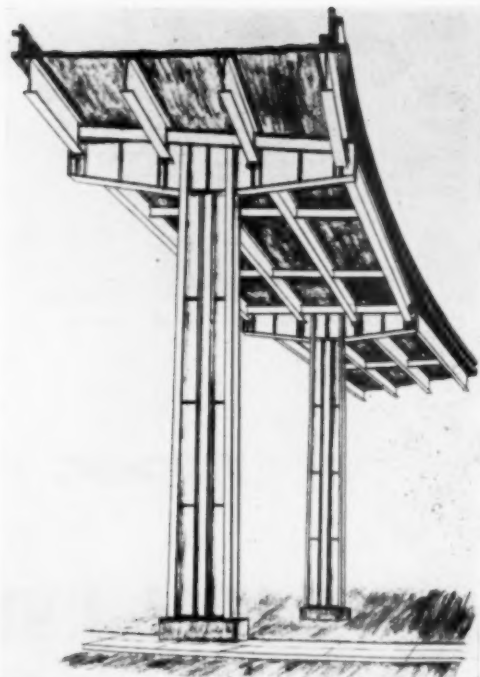
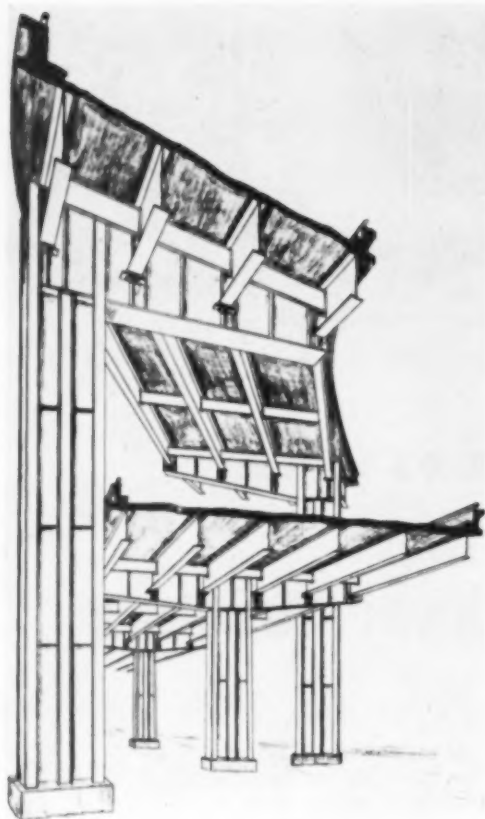
30 Acres of Roadways

All roadways shown shaded or cross-hatched on the Site Map are elevated and will carry freeway traffic over city streets, railroad spurs and in-

tersecting ramps of the interchange. Roadway widths vary from 26 ft. to 50 ft. with provision for from two to four lanes of one way traffic. Opposing traffic is completely separated either by an 8-ft. median strip or by virtue of being on separate structures. The elevated ramps and roadways have an area equivalent to 9½ miles of two-lane highway. Actual area of the structure is approximately 30 acres.

Roadway decks are of reinforced concrete carried on rolled beam or welded girder spans. Bents are composed of rolled or built-up welded sections with from one to three columns at each bent. Span lengths vary from 45 to 85 ft. for rolled beams and up to 117 ft. for welded girders. Foundation conditions are quite varied, and footings are supported by either rock or dense sand, or on piles.

Because of the magnitude of the



★ "C" shaped bents are used where upper ramps cross lower ramps at very large skew angles. Sketch shows a 2 lane ramp crossing over a 3 lane ramp

★ Typical ramp supported by "T" shaped bents, used for all 2 and 3 lane roadways. Roadways having 4 or more lanes are supported by 2 or 3 column bents

structure and its location in the heart of a major city, a considerable amount of time was spent on preliminary design studies. It is during the preliminary stages that the decision must be made as to whether a structure is to be constructed of steel or concrete. With due regard to economy, aesthetics, clearances, and required span lengths, decisions must also be made regarding major structural features.

Concrete vs. Steel

Economy, of course, was the major consideration in making the decision between concrete and steel. With average site conditions the cost of concrete T-beam or rolled beam spans is practically the same, but certain factors at this particular site favored the rolled beams. Roadways are rather high—averaging about 30 ft. above ground level, with some being as high as 60 ft. This would result in a considerable increase in the cost of forms and falsework for concrete construction but would have little effect on the cost of erecting steel girders. Preliminary foundation investigations indi-

cated that most of the footings would be on piles and that the piles would be as long as 140 ft. A concrete structure would be much heavier than steel and would thus require more of these long, expensive piles.

In addition to economic considerations there were several other factors that made steel construction more desirable. In order to be economical, a concrete structure should have continuous spans, but continuous spans would not be feasible in view of the varied foundation conditions and consequent possible differential settlement between adjacent footings. The presence of falsework in the city streets would be a hazard to public traffic. Concrete columns would be more massive than steel and would result in less visibility for motorists on surface streets.

Steel construction has one decided disadvantage, however, in that it requires periodic painting. Not only is this painting expensive, but it also creates a nuisance in urban areas. It was decided that the cost of painting could be somewhat reduced by incorpo-

rating into the structure's details provisions for rigging painting scaffolding. The mess generally associated with painting of structural steel will also be considerably reduced by requiring that the steel be sandblasted and prime coated prior to erection.

In view of all the above considerations, the decision was made to use a rolled beam type of structure supported by steel columns. It was felt that initial economy plus the other advantages would more than offset the cost of maintenance.

Welding vs. Riveting

Once the decision had been made to use steel, the next problem was to determine the type of steel construction to be employed. The decision to use welded construction throughout was based both on aesthetic possibilities and anticipated economy. It was felt that the appearance of an elevated steel structure of this type could be substantially improved if the usual complexity of detail associated with riveting were eliminated. By omitting stiffeners from the outside faces of

exterior girders, the longer built-up girder spans could be made to harmonize completely with adjacent rolled beam spans. By eliminating rivet heads and cover plates from girders, caps and columns, the entire structure would be made to present clean, simple lines. Bearing assemblies and other connections would also be less obtrusive.

Due to the lack of precedent in welded viaducts, an economic comparison between welding and riveting would necessarily be rather approximate. Early in the design stages, it was a simple matter to make comparative designs of typical spans, and it was found that welded construction resulted in weight savings of approximately 20% for girders, 20% for caps and 12% for columns, with an overall saving of over 18%. A close estimate of the cost of the riveted construction could be made as unit prices for riveted steel are well established, but the unit price for the welded construction could only be roughly estimated. It was felt, though, that even if it were assumed that the unit price of welded steel would be more than for riveted, the difference would probably not be enough to offset the 18% saving in weight.

Aside from economic possibilities, an 18% saving in the weight of structural steel is an important factor in view of present shortages and restrictions on the use of this critical building material.

Bids Show Economy

Based upon the known improvement in appearance and probable economy, it was decided to use welded construction for the entire structure. This decision appeared amply justified when bids were opened for the 9th and 10th Street Connections. The lowest of the four bidders was 17% below the State's estimate, and the highest bidder was 5% below the estimate. It was of interest to note that the unit price for steel was also considerably lower than for recent comparable prices for riveted steel.

Studies were made relative to the economy of using composite type rolled beam girders instead of ordinary rolled beams. In composite construction the concrete deck is fastened to the upper flange of the girders by means of shear keys welded to the supporting girders so that the deck will act as an additional upper flange, thus reducing the size of girder required for a given span. Comparative girder designs were made for a 57-ft. span length, and it was found that the composite construction resulted in a net saving of approximately \$300 per girder.

An additional advantage of composite construction is that it insures greater stiffness of the superstructure with resultant better riding qualities.

Spans up to 85 ft. are composed of 36" WF (wide flange) beams with 4" x 1" plate shear keys welded to the

upper flange. Cover plates are welded to the lower flanges of girders in the 70 to 85 foot range.

Composite welded girders are used for spans up to 117 ft. These girders are of standard welded girder design with rectangular flange plates fillet-welded to the web plates. Web stiffeners are rectangular plates welded to the webs with continuous fillet welds. Stiffeners are omitted from the outside faces of exterior girders so that the welded girder spans would present the same appearance as the rolled beam spans. In order to further increase resemblance to the rolled beam spans, the depths of the welded girders were kept to a minimum. Web plates vary from 42" x 3/4" to 54" x 3/4" and flange plates from 12" x 3/4" to 22" x 2 1/2". Details of a typical welded girder are shown on the accompanying sketch.

"T" and "C" Bents

Ramps having four or more lanes are supported by bents having two or three columns. T-shaped single column bents are used for most of the two and three lane roadways and in some instances, for four lane roadways. In structures of this type, having ramps which cross streets and other ramps at various skew angle, the T-bent is very effective in reducing the number of skewed bents. Skewed bents are not only unsightly but also result in complex framing. The use of T-bents also reduces the total number of columns,



★ Site Plan. All roadways shown shaded or cross hatched are elevated. Total area of elevated freeway is 30 acres

thus minimizing the usual "forest" effect common to elevated structures.

T-bent structures, being practically the ultimate in simplicity, are very pleasing in appearance. California has built several structures of this type in the past few years, and many favorable comments have been received from people who can appreciate the T-bent's aesthetic qualities even though they may have no knowledge of its structural advantages.

At some locations where sharply curved ramps crossed over lower roadways at a very large skew angle, it was found that means other than the use of T-bents would have to be resorted to in order to obtain a satisfactory span layout. The combination of a long span and a sharp curve would result in an extremely unbalanced loading condition on the girders. By using C-shaped bents at each end of these sharply curved spans, the span was reduced to a practical length.

Due to the presence of large bending stresses, columns for C-bents are generally quite heavy. Two of the C-bents on the structure have columns which weigh almost 1000 lb. per ft., which is equivalent to approximately 2 cu. ft. of steel per foot of column.

Welding Heavy Plates

In order to utilize fully the economic possibilities of welded construction, it was necessary that some of the plates used would be fairly thick. Many plates are over 1½ in. thick and a few run up to 2½ in. These heavy plates created a major problem in writing steel specifications. As the thickness of ordinary A7-49T steel plates increases, more and more carbon content is required in order to maintain specified tensile properties. Both thickness of metal and amount of carbon have marked effects on the weldability of the steel.

In this connection the most important discoveries relative to the metal-

lurgy of steel are the recognition of transition temperature and the effects of certain factors upon this transition temperature. In general, the transition temperature may be defined as the temperature at which the steel changes from a ductile to a brittle material. Above the transition temperature the steel will fracture in a ductile manner, and below this temperature it will exhibit extreme brittleness.

Figure 1 shows the transition temperature curves of typical steel. The vertical ordinate of the chart is the energy absorbed by a notched test specimen when the specimen is subjected to a standard impact test. This amount of energy absorbed is a measure of the brittleness of the steel, being high for a ductile steel and low for a brittle steel. The horizontal ordinate is the temperature of the steel at the time of testing.

Curve A of the accompanying Figure represents the transition temperature curve of the steel as rolled. For this condition the transition temperature would be in the range between -20° and 0°F. There are many factors which will shift the position of the curve, but this discussion will be limited to some of the most important, such as welding, thickness of metal, carbon content, grain size and preheating prior to welding. The effects of these various factors may be summarized as follows:

(1) If a steel plate is welded, the transition temperature is raised, and curve A would move to some point between C and D.

(2) If the plate is quite thick, the curve would move to D. (The molten metal adjacent to a weld is quenched more rapidly by a thick plate and becomes relatively brittle.)

(3) If the steel had contained more carbon, the curve would move to C, and for less carbon would move to B.

(4) If the steel had been made with finer grain size, the curve would move to B, and for coarser grain to C.

(5) If the steel of (1) or (2) had been preheated prior to welding, the curve would move back to some point between A and C.

From the preceding discussion, it is apparent that if brittleness (and possible cracking) of welded steel is to be avoided at some reasonable minimum temperature, certain restrictions should be placed on the manufacture and fabrication of the steel. This was considered in writing the steel specifications for the contract. As a result of numerous conferences with welding authorities, metallurgists and representatives from steel companies, it was decided that ASTM A7-49T steel would be satisfactory under the conditions in San Francisco for plates up to 1½ in. but that special steels and special welding techniques should be used for larger plates.

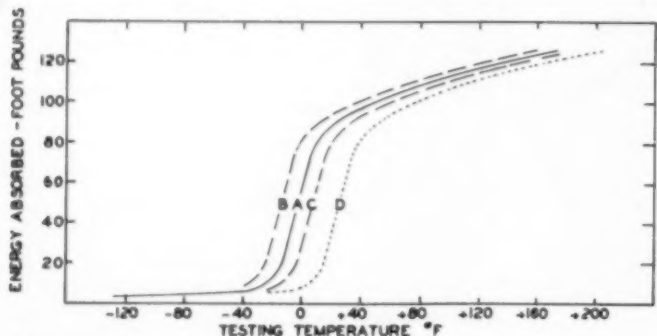
Special Steels

For the 9th and 10th Street Connections contract, A7-49T steel is used for plates up to 1½ in. thick, but the chemical composition of plates over 1½ in. thick is as follows:

	Ladle Analysis	Check Analysis
Carbon, max., percent	0.29	+0.04
Manganese, percent	0.60 to 0.90	±0.04
Phosphorus, max., percent	0.04	0.01
Sulphur, max., percent	0.05	0.01
Silicon, percent	0.15 to 0.30	+0.03 -0.02

The requirement was made that steel should be made with fine grain practice.

Property	Pls. 1½" or less (A7-49T)	Pls. over 1½"
Tensile strength, psi.	60,000 to 72,000	55,000 to 65,000
Yield point, min., psi.	33,000	27,500
Elongation in 8 in., min. %	25	21
Design stress, max., psi.	18,000	15,000

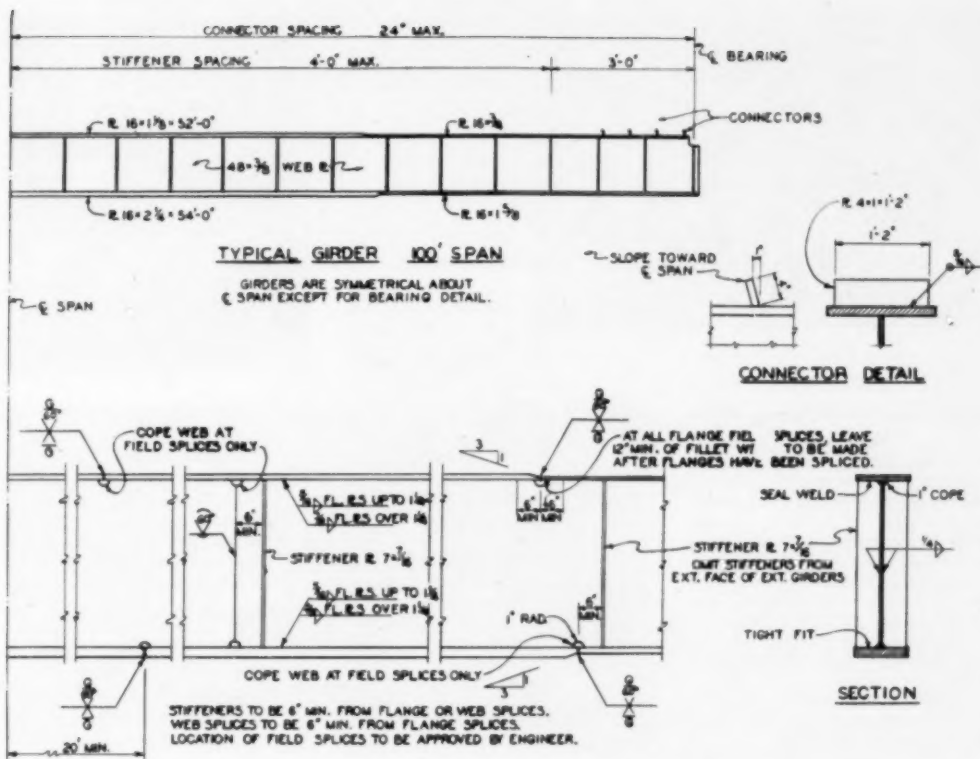


★ Transition temperature curves—typical steel

Because of the limitation placed on carbon content, it was necessary that required tensile properties would be less than for A7-49T. These revised tensile properties are listed above. Properties for A7-49T are also shown for comparison.

Special Preheating

As previously pointed out, an effective way to improve the service properties of thick plates that are to be welded is to preheat the parent metal prior to welding. Special preheating requirements were therefore included in the steel specifications. In



★ Most of the spans are carried on rolled beam girders, but some of the longer spans have welded girders similar to that shown above. Connectors shown on upper flange of girder are used to fasten concrete deck to girder so that the deck will serve as a portion of the girder.

lieu of provisions in the specifications of the American Welding Society which specify that temperatures of contiguous areas should not be less than 130° F. when welding members of heavy sections, the provision was made that temperatures of contiguous areas about a welding operation should be substantially equal, and not less than 300° F.

It is possible that steel specifications for heavy plates will be revised on later contracts. Recently it has been proposed to decrease carbon even further and to increase the manganese content so that tensile properties could remain practically unchanged.

Fabrication Tolerances

Present fabrication specifications do not contain definite requirements as to tolerances for shape and alignment of built-up welded beams and columns. It was felt that some reasonable criteria should be established in order to insure a definite quality of fabrication and to provide a "measuring stick" for the State's inspectors. Welding experts and representatives

from steel fabricators were consulted, and it was agreed that fabrication tolerances for built-up girders and caps should not be more than 50% greater than the AISC tolerances for WF shapes, and for built-up columns should not be more than 50% greater than the AISC tolerances for WF shapes specified as columns.

Field Inspection

It is planned that the major portion of the steel inspection for the project will be performed in the shop when the sections are being fabricated. Trained inspectors will observe and control such things as fit-up, temperature of steel, and rate of cooling. Welding requiring special techniques or equipment is to be done only by operators qualified to operate the particular equipment involved. The quality of the completed welds will be ascertained by making spot checks with devices such as Gamma Ray equipment and by taking cores of the metal for microscopic study.

The Division Street Interchange is the largest welded highway structure

to be designed by the State of California, but it is by no means the only one. In addition to several completed structures, there are at present over twenty bridges in various stages of design or construction in which welding is employed as either the major or only means of fabrication. It would be difficult to predict the future for welded highway structures, but it would appear that with the success of the \$15,000,000 Division Street Interchange and the other jobs which are being planned or constructed, fabrication by welding should move ahead rapidly on the Pacific Coast.

The Division Street Interchange was designed by the Bridge Department of the California Division of Highways under the direction of F. W. Paphorst, Assistant State Highway Engineer, Bridges. The General Contractor for the 9th and 10th Street Connections is Charles L. Harney, Inc., of San Francisco, with fabrication and erection of structural steel being subcontracted by Bethlehem Pacific Coast Steel Corp. of Alameda.

JOB and EQUIPMENT IDEAS

★ Driver operating the "talk-listen" switch. (Right): View at the rear showing speaker mounted immediately in front of the spray control operator



★ Spray lining truck showing the distance separating the driver and the spray operator

Iowa Speeds Striping With "Intercom"

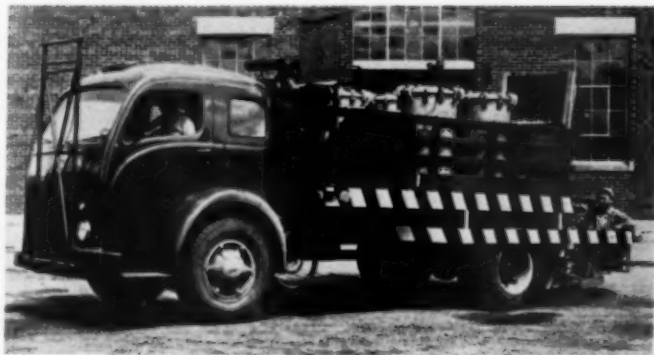
Difficulties which arise in the coordination of the work of a highway spray-paint truck engaged in road lining operations have been handily solved by the Iowa State Highway Department.

Former "horn honking" signals have been replaced by a Teletalk intercommunication system, such as is seen in factories and business offices, permitting two-way voice communication between driver and spray operator. This prevents misunderstandings when traffic or painting conditions make stops or turn-outs necessary.

Two Iowa highway trucks have been equipped with these systems, said to be very effective in speeding up highway lining operations.

Navy Engineers Develop Concrete Pile Puller

A concrete pile-pulling device having interesting possibilities for application by private contractors has been developed and built recently by per-



sonnel of the Navy Civil Engineering Research and Evaluation Laboratory at Port Hueneme, California. The puller has successfully extracted concrete piles up to 30 ft. long without damage to them.

The puller consists of a large 38-in. outside-diameter ring, 4 in. wide and 3 in. thick, with four gripping pads at the quarter points. Each pad of the pulling device operates on a two-point

suspension principle, with a spreader acting as a fulcrum to apply gripping pressure.

This puller which is pictured here, was perfected in conjunction with test drives, made with the new diesel-driven power hammer recently developed also by the Navy. The objective was to retrieve the test piles in good enough shape to allow them to be re-driven in future pile-hammer tests.

★ (Left): How the pulling device looks when applied and ready for exerting pull-out pressure. (Right): Close-up showing structural details. As lifting begins, steel wing rises towards vertical position, forcing the contact plate against the side of the pile to effect a tight grip.



Pipe Joints Tested With Bicycle Pump

The U. S. Bureau of Reclamation has worked out a unique method of testing the joints of 42-in. reinforced concrete pipe, with the use of water and air pressure from ordinary tire pumps. Engineers say that the new method saves much time and money by discovering defective joints before completed laterals are covered and placed under test.

The pipe pictured is part of a distribution system being built in the California Central Valley Project. The workman is using a tire pump to place water and air pressure on a completed joint. The ring is seen in position, with a rubber gasket on each side of the



1 S. J. Groves & Sons Company built this heavy stone spreader for turnpike project



2 Stone Spreader seen on the Geo. M. Brewster & Son job

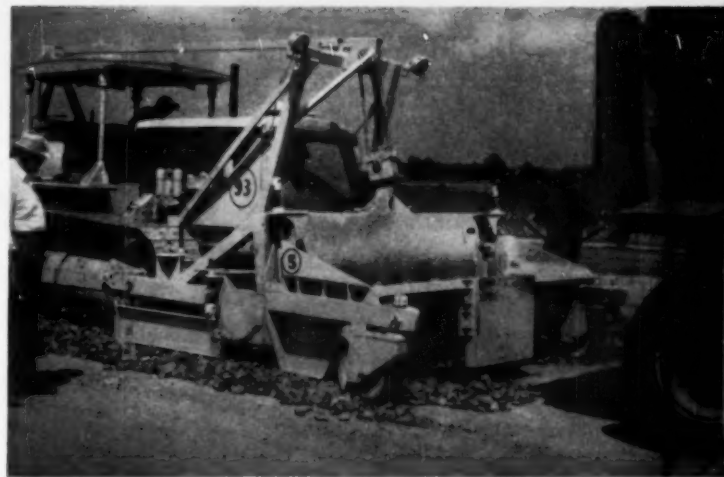
joint. Space between the gaskets is filled with water and subjected to air pressure equivalent to the hydraulic pressure for which the line is designed. If the joint is not tight water will leak to the outside of the pipe and repairs can be undertaken while access is easy, and before additional pipe is laid.

Turnpike Contractors Build Special Spreaders for Base Stone

The accompanying pictures show details of two heavy-duty spreaders, each designed and built for placing 4½" and 3" compacted thickness layers of penetration base stone on the New Jersey Turnpike.

1. This machine was seen on Section 1 on the Southern end, as part of the equipment used by S. J. Groves and Sons Company, paving contractor.

2. This unit was built and used on



Sections 3 and 4 by George M. Brewster and Sons Company [Sept. '51 **ROADS AND STREETS**].

As can be seen in the photos, both machines were heavily built, with sturdy framing built onto a Le Tourneau bulldozer apron, in turn mounted on a D8 Caterpillar tractor. Both units are designed to be lifted by the dozer cable, and to ride at the forward end

on rubber-tired wheels. Both units have adjustable spreading height.

[These machines are pictured by the **ROADS AND STREETS** editors as examples of the contractors' efforts to speed up heavy stone placement. According to turnpike engineers, however, these spreaders were not wholly satisfactory from an engineering control standpoint, due to tendencies to segregation and unevenness. They do focus attention on the contractors' desire for heavier duty, higher capacity equipment for spreading such harsh materials as large penetration type penetration stone.—Editors.]

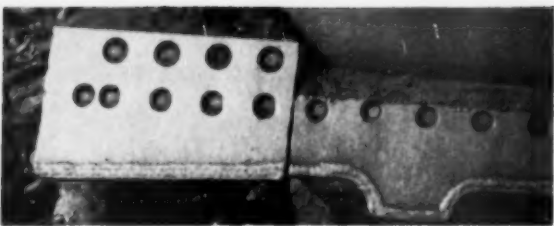


★ Bicycle tire pump applying pressure to testing ring

Manufacturers' News

Mohler Joins NPA. J. W. Mohler, assistant director of sales for Caterpillar Tractor Co., Peoria, Ill., will become deputy director of the Construction Machinery Division of NPA, where he will serve for one year beginning March 15. W. S. Zeigler, now manager of Caterpillars eastern sales division, will take over the duties of assistant director of sales during Mr. Mohler's absence.

3M Opens New Sales Office. Minnesota Mining & Manufacturing Co., St. Paul, Minn., has opened a new regional sales office at Warehouse Building at 732 Ashley St., N.W., Atlanta, Ga.



Hard-Facing . . . Helps Conserve Highway

Equipment in Nation's Biggest County

★ (Above): Faster dosing or loading with less horsepower is claimed with this special blade devised in San Bernardino County shop. The wide, tooth-like sections are welded to an ordinary blade and electrically hard-faced. Shape permits some of the fines to spill through and remain behind, providing a smooth cushion on which the crawlers can travel with less tractive effort (Photos courtesy Stoodly Company)

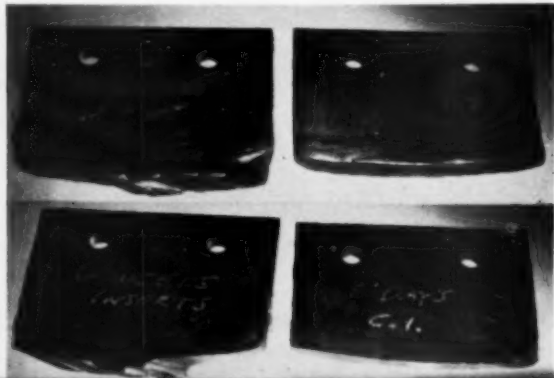
★ (Below) Asphalt mixer paddles are hard-faced profitably. Those at left in close-ups were faced with special inserts; those at right are ordinary cast-iron blades after only 6 days of use

68

A VISITOR to San Bernardino County, in southern California, will find that this county is not only the Nation's largest geographically, and custodian of one of the largest county highway systems (4,000 miles), but is also rated as one of the most progressive in its highway management. The County's highway maintenance force has an enviable reputation for the excellence with which it performs its big job. And much in the spotlight today because of growing equipment stringencies is the county's

program for maintaining its 440 units of highway equipment.

In this equipment upkeep, welding and hard-facing play an important part. The possibilities of repairing, salvaging or prolonging the useful life and efficiency of road equipment through welding have in fact been employed to the economic limit. Under master mechanic Otto Johnson, in charge of the county's central shop, routine methods have applied systematically and innovations (see dozer and scraper blades) worked out to





★ Tire chains, used extensively in plowing snow from mountain roads, are hard-faced for longer service



★ Tractor grousers protected by beads of hard-facing metal applied on the wearing edge

make equipment perform longer and more efficiently. Credit also goes to Ed Reese, blacksmith foreman, and others on the shop force, for many seemingly small but nevertheless money-saving applications of hard-facing that will interest highway maintenance men everywhere. Some of these are pictured on these pages.

It should be noted that San Bernardino County takes in irrigated valley, desert, and high mountains. Equipment working out from the central shop must operate under the widest range of conditions. Much work involves handling boulder-strewn gravel, stone and abrasive soils highly destructive of equipment wearing parts. Among the parts which are hard-faced to prolong useful life as a regular policy are snow plow blades, bulldozer blades, scraper blades, tractor grousers, mixer paddles, bucket lips and teeth, and—yes—tire chains.

Recently Mr. Reese developed a blade for bulldozer or scraper use which, it is said, will load faster with less horsepower and requires only a short load-run. The novel design of the blade allows some of the fines in the material being dozed to remain in the cut, providing a smoother cushion on which the crawler pads ride. Wide tooth-like sections are welded to an ordinary blade and electrically hard-faced as shown in the photographs. This blade has saved considerable time and fuel and has given longer life to the crawler pads and grousers.

Paddles used for mixing paving oil and aggregate in the road mix machines were for years a troublesome maintenance problem. Service life and efficiency of these replaceable blades have been increased many times by properly applied hard-facing. Tungsten carbide inserts were set in the leading edge of the paddles and then overlaid with hard-facing material. Successive stages are here illustrated.

Howard L. Way is County Surveyor and County Highway Commissioner of San Bernardino County.

New Data On Subsurface Drainage

Bulletin No. 45, Highway Research Correlation Service. This bulletin contains a report of the Committee on Subsurface Drainage entitled "Present Practice in Subsurface Drainage for Highways and Airports." It is a tabulation and interpretation of replies to a questionnaire sent to the state highway departments and to selected divisions or departments of the Bureau of Public Roads, the Corps of Engineers, Bureau of Reclamation, and the Civil Aeronautics Admin.

Nearly all replies stated that faulty subsurface drainage caused pavement failures, including rutting and shoving in flexible pavements, pumping in concrete pavements, and frost heaves and boils in both types of pavement.

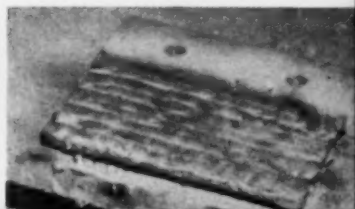
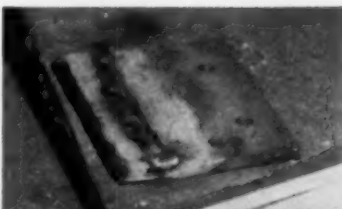
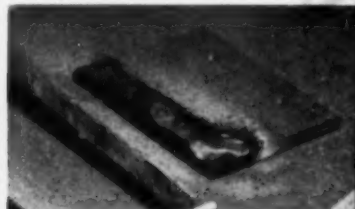
Practically all replies gave clogging of backfill material, and sometimes pipe, as the chief cause of subsurface drainage failures. Under improvements since 1942, practically all replies noted improved backfill material; their specifications now call for concrete sand, clean bank-run sand, or

bank-run gravel (or the equivalent) for backfill with occasionally $\frac{1}{2}$ or $1\frac{1}{2}$ -in. stone given as an alternate. About half the organizations use either a filter test or the Vicksburg piping ratio criterion for filter design.

Depth of pipe invert or deep ditch varies between 2 and 6 ft.; usually it is about 2 ft. deeper than the average frost penetration under a bare pavement. About two-thirds of the states report that subbase is carried out to full width of shoulders; the balance replied that it is carried only to 1 or 2 ft. beyond edge of pavement. Total thickness of surface, base, and subbase varies widely with conditions of frost, soil, traffic, etc. and is from 6 to 32 in. thick.

The report was prepared by Philip Keene, engineer of soil mechanics and foundations for the Connecticut State Highway Department and chairman of the Board's Committee on Subsurface Drainage, and Seward E. Horner, chief geologist for the Kansas State Highway Commission. Address request for copy of Bulletin No. 45 to the Highway Research Board, 2101 Constitution Ave., Washington 25, D.C.

★ Steps in renewing asphalt mixer paddles. (Upper Left): Cobalt borium inserts have been tacked in place. (Upper Right): Inserts covered with pass of mild steel. (Lower Left): A bead of hard-facing is applied to back up the inserts. (Lower Right): Deposit of cast iron covers balance of face





★ How state highway bridge at Manhattan, Kansas appeared after flood subsided. Piers undermined, fill washed out between rail trestle and near bank. Dozer seen at left pushing riprap stones into water to aid in silting underwater slope, as temporary protection

Field notes on how emergency crews of Kansas highway department anchored weakened piers, built protective riprap, drove sheeting and concreted new deep footings, to restore highway bridge following the all-time-record 1951 flood

New Footings for Scoured Pier

By W. M. Stingley

Division Office Engineer, State Highway Commission of Kansas, Topeka

WHEN the July floods subsided in Kansas, one of the few bridges still in place over the Kaw River was a 2059-ft. structure at Manhattan carrying State routes 13 and 29. This is a combination bridge and viaduct, with 12 plate girder spans at its western end spanning Union Pacific tracks and several streets. The river section 792 ft. long includes 5 trusses, and the east approach is a 3-span plate girder 271' 10" long, over a single rail track.

The bridge was examined briefly soon after the crest of the flood had passed and appeared to be unharmed. It was noted, however, that the main channel of the stream had moved about 150 ft. to the east. Due to the fact that flood control dams on a tributary were, for several weeks, dumping impounded water in an effort to recover their storage potential, it was some time before a river stage existed low enough to permit determining the real damage.

When the stream had finally returned to a near normal level, it was discovered that one of the piers of the east approach section was undermined. This pier, when built 16 years ago, was located about 150 ft. from what had long been a stable shore line, and was now in the channel. It is a twin-column pier, with a tie beam 17 ft. above the footings, and carries a dead load of approximately 400 tons. Footing excavations were carried down 10 ft. The footings consist of 4' x 10' x 12½' slabs. Twenty timber piles

had been driven in each footing to a calculated bearing of from 23 to 35 tons, with 15 to 28 ft. penetration.

These piling were now exposed under both footings with 5 to 6 ft. of pile exposed to water. In addition, the bottom was very soft and mucky, approaching quicksand, and an undetermined depth of such material had evidently been deposited during the subsidence. One pile had been broken off, possibly during salvage operations of railroad equipment lost in the river. The railroad had built a trestle replacing their lost approach embankment angling under the highway structure (see photo) and its necessary position complicated operations.

Watched for Scour

The river bank just east, or inland, from the affected pier was saturated and quaky, and it was felt that the use of any heavy equipment might precipitate a slide with disastrous results, since the piling now had very little lateral support. The pier itself seemed to be very nearly plumb, but the rockers on the cap were tipped considerably more than they probably should have been. However, the pier's slight deviation from the vertical was opposite to a direction which would have accounted for the rotation of the rockers, unless the bottom of the pier had moved.

As a temporary measure it was decided to wedge the rockers to prevent further tipping of the pier top, and also cable the cap each way to the superstructure. Cables were also placed from the bottom of the pier to the next pier, approaching the abut-

ment, to provide some lateral support. Meanwhile in the highway commission's Topeka office, W. S. McDaniel, assistant to R. C. Keeling, chief engineer, had by this time secured the promise of a shipment of scarce sheet piling, enough to drive a ring around each footing. So in collaboration with E. S. Elcock, bridge engineer, and L. J. Siler, maintenance engineer, a plan was worked out whereby it was felt that the piling could be placed without undue risk of starting a slide.

Starting at a point on the bank about 50 ft. upstream from the nearest footing, large riprap stones (500 to 4,000 lb.) were dumped and dozed into the channel. This was done both to secure a working platform and to prevent further scour, and perhaps by sedimentation to flatten the slope of the river bottom sufficiently to lessen the chance of a slide. At one stage the bottom, composed of muck and silt, sloped from a depth of zero to 25 ft. in a distance of 30 ft.

This jetty was continued out, in spite of one slide, until it could be hooked around the stream side of the footings. An interesting sidelight during this operation occurred when a pile of rock, dozed from the end of the jetty, sank into the water and muck, and a dragline bucket rose to the surface and was recovered. It had been lost by the railroad when a flat car, carrying a crawler crane, had been overloaded while pulling drift and tipped into the stream. The crane and flat car had previously been removed.

The sheet piling was now placed and driven in two rings of 42 Inland

What is the Construction Business Coming To?

In our December issue in connection with an article describing a big aggregate production operation for the New Jersey Turnpike, we published the accompanying picture. It shows a welder busy applying hard facing materials to a scalping grizzly.

The Editor's day was ruined recently by a letter about this article from a secretary in an Iowa contractor's office. She wrote "Am glad to say that we do not have men in our employment as tattered. Please, no more such pictures!" It was signed "A secretary who eventually gets time to read the boss's mail."

To the best of our knowledge no welder has ever been nominated for place among the "ten best dressed men of America." Perhaps some of the readers could bring us up-to-date on Esquire's rules for correct formal attire by welders, quarry workers and construction stiffs in general.

Or maybe this gal was kidding us.—Editor's note.



piles each. This provided rings about 16' 4" in diameter, which permitted a little clearance at each corner of the footings. The piling had been secured in random lengths, from 10 to 38 ft., mostly 35 ft.

The random lengths worked out very well since there was insufficient head room for one-piece piling of great enough finished length. The tie beam between the columns also had to be avoided. By alternating long and short piles, and filling out with short pieces, the rings were completed and driven to a depth of 31 ft. According to borings made at the time the bridge was built, this should place the tips in hard shale, and this condition seemed to be born out by the near refusal obtained. The rings were distorted to some extent by what was thought to be riprap rock buried deep in the muck, but it is felt that the finished rings are tight and stable.

The top few feet of muck was then pumped out and the rings were back-filled with sand to within 3 ft. of bot-

tom footings. Since it had been decided to transfer part of the pier loading to the sheeting, holes were burned in the piling and a grillage of 1½ in. reinforcing bars placed and welded to the sheet piles. Piles which were not attached to a bar were fitted with anchors about 12 in. long welded to the sheeting. About 25 cu. yd. of concrete was poured in each ring, reaching top of piling cut off 1 ft. above bottom of footings.

The final step consisted of dozing rock between the rings, and leveling off around them. The wedges were also removed from the rockers and the cables taken down. Only after the work had been completed was it fully realized how "limber" the pier had been, since a very noticeable reduction in vibration occurred after the concrete had been placed.

This work was done entirely by maintenance forces attached to the Kansas highway department, none of whom had had previous experience with similar work. An attempt was

made to secure a contractor having proper equipment, but none was found immediately available. Since the work was considered very urgent, it was done with rented equipment and State forces, and brought to a successful conclusion. This bridge is in the department's First Division, L. H. Vincent, division engineer, and L. G. Bean, assistant division engineer, Maintenance.

Manufacturers' News

Lehman Retires. Chester H. Lehman, identified with Blaw-Knox Co. 42 years, has retired as executive vice president. He will continue as a director and vice chairman of the board and also will serve in an advisory and consulting capacity to the president.

Elected President. C. B. Smythe, president Thew Shovel Co., Loraine, O., has been elected president of the Power Crane and Shovel Association.

Weber Appointed Vice President. Milton J. Weber has been appointed vice president, procurement, of The Frank G. Hough Co., Libertyville, Ill.

★ Views taken during progress of repairs. Pier top was tied by cables to prevent tipping. Columns anchored to adjoining abutment until repairs completed





★ Loading borrow material from a spoil bank and mucking Everglades type swamp mud on the R. H. Wright & Son's project in Florida

"Knockin' out the Yardage"

Florida Contractor Moved 30,000 Cu. Yd. Per Week

A best week of 30,000 cu.yd. with an average of over 20,000 yd. per week, was reported by R. H. Wright & Son, Inc., Fort Lauderdale, Florida, for a job done in 1950.

The road is Highway 80 in Palm Beach County, the project being five miles in length and consisting of grading and placement of limerock. The job included 355,000 cu.yd. of sub-soil excavation (A-8 material); 100,000 cu.yd. of roadway excavation; 200,000 cu.yd. of borrow for canal spoil bank; 65,000 cu. sq. yd. of native limerock pavement. The road-

bed consisted of an 8-in. limerock base and a 12-in. stabilized subgrade 22 ft. wide with a double bituminous surface treatment.

The earthmoving outfit comprised a 1 1/4-yd. Lima dragline, 1 1/4 yd. Marion dragline, two 3/4-yd. Lima draglines, one 3/4-yd. Lorain dragline, four Euclid bottom-dump wagons (13-yd.) and 10 dump trucks.

This interesting job was on the edge of the Everglades district of Florida, where muck removal averaged 6 ft. depth with a maximum depth of 14 ft. and the water table always stood within a foot of the surface. The borrow area was a spoil bank of an existing canal. The haul averaged four miles.

Muck had to be totally removed to allow placing of the fill materials (A-2

and A-3 quality). It was necessary to handle some of the muck two or three times to get it in proper position as shoulder fill. Excavated rock was used to flatten slopes after fill was placed. The entire job was completed in ten months, or 150 days ahead of schedule. Traffic was maintained at all times, despite a hurricane that flooded the adjacent areas, and the necessity of cutting a special detour. D. W. Smoak was job superintendent and J. A. Walker, general superintendent for the contractor.

First Aluminum Traffic Control Arches

Eight Alcoa aluminum traffic control arches now regulate the flow of traffic over the Delaware River bridge between Philadelphia and Camden, one of the most heavily traveled bridges in the nation. They are believed to be the first such structures of aluminum. Each arch holds 16 red and green signal lights to indicate which lanes are closed and which are open to traffic in either direction. Spaced at intervals of 750 ft. along the 1.8-mile long span, the eight new aluminum arches make it possible to control traffic for the entire length of the bridge. Formerly there had been only two control arches, located at the bridge towers. The 79-ft. wide bridge roadway is divided into eight traffic lanes, which can be opened and closed in any possible combination under that figure. Each of the arches weighs 8,700 lb. and is 84 ft. long, 4 ft. wide and 5 ft. deep. They were manufactured of Alcoa aluminum by the Pittsburgh-Des Moines Steel Company.

25-Year Men

25-Year Awards. The AASHO at Omaha gave merit awards to 186 state highway employees who reached the 25-year status as employees during the past year, bringing the list of such awards to 1731 to date. Tennessee and Kentucky led the states with 22 and 20 such awards, respectively, with Public Roads men numbering 27.



Grid Floor Grooved for Skid Resistance

★ Non-skid grooves are being cut in a steel grid deck of a street bridge at Cambridge in Boston. A special milling machine adapted to this purpose consists of six 24-in. blades driven by a 50 hp. motor. The operation is said to eliminate the former costly procedure of taking up the grid floor in sections and returning them to the factory to have grooves cut periodically to keep satisfactory traction. (Acme)



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Review of Gillette's Heavy Construction Catalog File

This first annual edition is a compilation of catalogs of manufacturers serving the heavy construction field with materials, equipment, and accessories. Manufacturers' catalogs are bound in the book alphabetically. To assist the user there are three indexes, as follows:

1. Manufacturers Index (alphabetically arranged)
2. Product Index (alphabetical by products advertised)
3. Trade Name Index (alphabetical)

Copies of the individual catalogs of manufacturers included in this book can be obtained by writing direct to the manufacturer.

Following is a short review of each manufacturer's catalog:

Adams Mfg. Co., J. D., Indianapolis, Ind. An 8-page catalog of descriptive matter, specifications and illustrations of their various motor graders with attachments, and their travelator.

Alemite-Stewart-Warner Corporation, 1826 Diversy Parkway, Chicago 14, Ill. A 4-page catalog on Alemite portable service stations for lubrication of construction equipment.

Allis-Chalmers Mfg. Co., Tractor Division, Milwaukee 1, Wis. A 20-page catalog containing illustrations and descriptions of Allis-Chalmers tractors, motor graders and power units and allied equipment.

All Purpose Spreader Co., Elyria, Ohio. A 4-page catalog of descriptions, illustrations and specifications for wideeners, base pavers, bituminous pavers, finishers, widening clippers and paving rollers.

The American-Coleman Co., 340 W.O.W. Building, Omaha 2, Neb. A 4-page catalog of descriptive matter and illustrations on motor graders, grader attachments and Colman 4-wheel drives and front-wheel drive axle.

American Steel Works, 1211 West 27th St., Kansas City 8, Mo. A 6-page catalog of descriptive matter and illustrations on smooth rollers, melting kettle and tamping rollers.

American Tractor Corporation, Chubbuck, Ind. A 2-page catalog sheet on the new "Terratrac" G7-30 tractor, including descriptive matter, illustration and specifications.

American Tractor Equipment Corp., 9131 San Leandro Blvd., Oakland 3, Calif. A 4-page catalog containing descriptive matter and illustrations on bulldozers, wheel scrapers, front end loaders and rippers.

Anthony Company, Streater, Ill. A 2-page catalog sheet giving illustrations and descriptive matter on Anthony heavy-duty hydraulic hoists and bodies. Nationwide list of Anthony distributors is included.

Armo Drainage & Metal Products, Inc. An 8-page catalog illustrating and describing Armo Construction products. Armo services also are described.

Austin-Western Co., Aurora, Ill. A 12-page catalog illustrating and describing its power graders, road rollers, shovels and cranes, crushing and screening plants, street sweepers, snow plows, loaders and miscellaneous equipment.

Barber-Greene Co., Aurora, Ill. A 2-page catalog sheet containing pictures and descriptions of bituminous mixing and paving equipment, vertical boom ditchers, permanent and portable conveyors, and bucket loaders.

Bicknell Manufacturing Co., 21 Lime St., Rockland, Me. A 2-page catalog sheet pictures and describes the Bicknell diggerdrill, paving breaker and digger tools, and Bicknell pneumatic utility tools and tampers.

Be-Ge Manufacturing Co., Gilroy, Calif. A 2-page catalog sheet illustrating and describing tractor mounted trenchers and earthmoving and leveling equipment.

The Bin-Dicator Co., 13946-Y Kercheval Ave., Detroit 15, Mich. A 2-page catalog sheet gives facts on bin level indicators, aerator units and shows typical applications.

E. V. Briscoe & Son, Ashlan & Del Norte Sts., Kerman, Calif. A 4-page catalog illustrating and describing Briscoe ditchers and slopers, specifications are included.

Bucyrus-Erie Co., South Milwaukee, Wis. A 2-page catalog sheet describes the hydrocrane and pictures some of its uses as a crane and as a trenching machine. Specifications are included.

Wm. Bros Boiler & Mfg. Co., Minneapolis 14, Minn. A 6-page catalog on its medium and giant weight tampers, portable steam boilers, asphalt circulators and heaters, pneumatic tire rollers, and Bros roll-o-pactor. Specifications are included.

The Buda Co., Harvey, Ill. An 8-page catalog illustrates and describes diesel engines, diesel electric generator sets, gasoline-electric generator sets, gasoline engines. Charts are included showing diesel engine and gasoline engine horse power, and giving details of the various models of the electric generator sets.

Buffalo-Springfield Roller Co., Springfield, Ohio. A 2-page catalog sheet pictures and describes the various models of 3-wheel, tandem and trench rollers. Distributors of the rollers are listed.

Butler Bin Co., Waukesha, Wis. A 2-page catalog sheet illustrates and describes aggregate and bulk cement bins, weighing batchers and ready mixed concrete plants.

Carey Manufacturing Co., The Philip, Cincinnati 15, Ohio. A 2-page catalog sheet on Carey elastite products for concrete and masonry construction. Included are expansion joints for pavements, sealing compounds, subgrade felt and asphalt plank.

Carter Co., Ralph B. A 4-page catalog, devoted to Humdinger pumps, illustrates and describes self priming centrifugals, single and double diaphragms, and high pressure gasoline and electric pumps. Tables giving capacities of various models are included.

C. H. & E. Manufacturing Co., 3840 N. Palmer St., Milwaukee 12, Wis. A 2-page catalog sheet is devoted to con-

struction equipment, including wood-working machinery, diaphragm, self-priming centrifugal and jetting pumps, builders hoists, mortar mixers, bender and bar cutters and a 3 to 4-ton tandem roller.

Chausse Mfg. Co., Inc., 4453 Fourteenth St., Detroit 8, Mich. A 2-page catalog sheet illustrates and describes Chausse equipment including distributors, melting kettles, unit for applying curing materials, oil burning torches and portable heaters.

The Cleveland Trencher Co., 20100 St. Clair Ave., Cleveland 17, Ohio. A 4-page catalog pictures and describes and gives specifications for six models of trenching machines. A section also gives details on Cleveland trailers.

Clipper Manufacturing Co., 2800 Warwick, Kansas City 8, Mo. Five models of Clipper concrete saws are illustrated and described and other varied uses told in this 4-page catalog. Specifications are given.

Concrete Sawing Equipment, Inc., 200 National Bank Bldg., Pasadena 1, Calif. A 2-page catalog sheet features the concrete concrete saw, which is pictured and described. Specifications are included.

Construction Products Corporation, 4041 Goodwin Ave., Los Angeles 29, Calif. A 2-page catalog sheet of descriptive matter, illustrations and specifications on the CPC trencher.

Continental Motors Corporation, 206 Market St., Muskegon, Mich. This 4-page catalog deals with continental red seal engines and power units, which are pictured and described. Details of various model engines are included.

Cummer & Son Co., the F. D., 1827 East 18th St., Cleveland 14, Ohio. Cummer portable, semi-portable and stationary asphalt plants are featured in this 2-page catalog sheet. Cummer mechanical feeder with storage bin, two-fire combustion dryer and Cummer mixer are also illustrated and described.

Cummins Engine Co., Inc., Columbus, Ind. An 18-page catalog on Cummins diesels, containing descriptive matter, illustrations and condensed specifications of various models, together with torque, horsepower and fuel consumption curves. A Cummins diesel engine horsepower chart is included.

Davenport Besler Corporation, 2315 Rockingham, Davenport, Ia. A 4-page catalog illustrates and describes Davenport-Frink Sno-Plows. Specifications are included for V-type one-way blade and sidewalk snow plows.

Davey Compressor Co., Kent, Ohio. Portable compressors are featured in this 4-page catalog. The various models are pictured and their outstanding features described.

Detroit Diesel Engine Division, General Motors, Detroit 28, Mich. An 8-page catalog containing descriptive matter and illustrations of General Motors diesel engines. Exclusive features of these engines are graphically illustrated.

R. E. Dietz Co., Syracuse, N.Y. A 2-page catalog sheet illustrating Dietz contractors lanterns and torches. Specifications for each model are given.

Dorsey Trailers, Elba, Ala.—Low bed trailers are illustrated and described in this 2-page catalog sheet. Specifications are given.

Eagle Crusher Co., Inc., Gallon, Ohio. Eagle Model 400-A loader and Eagle crushers and hammer mills are pictured and described in this 2-page catalog sheet.

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Electric Tapper & Equipment Co., Ludington, Mich. A 12-page catalog on Jackson vibratory equipment. Illustrations and descriptions are included on side form vibrators, electric vibrator screed, vibratory paving tube, mass concrete vibrator, vibratory compactor, electric concrete vibrator and flexible shaft vibrator and external vibrators. A section deals with Jackson portable power plants.

Flexible Road Joint Machine Co., Warren, Ohio. A 4-page catalog containing descriptive matter and illustrations of Flexplane equipment, including finishing machines, mechanical dowel and tie-bar installers, mechanical joint installers and automatic curing machines.

Flintkote Co., The, 30 Rockefeller Plaza, New York 20, N.Y. A 2-page catalog sheet dealing with "Flintseal" rubber asphalt compound for joint sealing. It tells what it is and how it is used.

Ford Motor Co., 15050 Woodward Ave., Highland Park 3, Mich. This 8-page catalog features the complete Ford line of industrial engines and power units. Illustrations and descriptions of the various units are given and a table of specifications is included.

Foundation Equipment Corporation, 3711 10th St., Long Island City 1, N.Y. A 2-page catalog sheet telling what the Foundation wellpoint system does in dewatering wet jobs. A pre-bid engineering service is described.

Fraco Manufacturing Co., Rt. 2, Bloomville, Ohio. A 2-page catalog sheet on the Fraco hot spray bar. Features of the bar are illustrated and described.

Galion Allsteel Body Co., Galion, Ohio. This 4-page catalog illustrates and describes Galion hydraulic hoists and all-steel dump bodies. Details of Galion's fulcrumatic hoist are pictured and described. Galion distributors are listed.

Galion Iron Works & Mfg. Co., Galion, Ohio. A 2-page catalog sheet illustrating and describing motor graders, three-wheel rollers, tandem rollers and portable rollers.

Garrison Manufacturing Co., 1506 South Santa Fe Ave., Los Angeles 21, Calif. Advantages and uses of Garrison hydraulic power steering booster for trucks, motor graders and wheel tractors are stated in a 2-page catalog sheet.

Gledhill Road Machinery Co., Galion, Ohio. This 4-page catalog contains descriptions, illustrations and specifications for snow plows, pull type graders, traffic line marker, and a front dump type scraper.

Goodall Rubber Co., 220 Whitehead Road, Trenton 4, N.J. Steam, air, water, suction, grout and concrete placing hose, dredging sleeves, conveyor belting and waterproof boots and clothing are illustrated and described in this 4-page catalog.

H & L Tooth Co., 1540 Greenwood, Montebello, Calif. A 2-page catalog sheet picturing and describing teeth for clamshells, shovels, hoses, draglines, rippers, scarifiers and trenchers.

Harnischfeger Corporation, 4400 W. National Ave., Milwaukee 14, Wis. This 12-page catalog illustrates and describes P & H power shovels, truck cranes, diesel engines, "single pass" soil stabilizers, and welders and electrodes. Two pages are devoted to illustrations and descriptions of operating methods for the soil stabilizer.

Hauck Manufacturing Co., 105-115 Tenth St., Brooklyn 15, N.Y. Equipment for heating, thawing, melting and drying are illustrated and described in this 2-page catalog sheet.

Heltzel Steel Form & Iron Co., Warren, Ohio. A 4-page catalog on stationary batching plants, portable bulk cement plants, portable aggregate plants, portable highway bins, road and airport and curb and gutter forms, and concrete buckets.

Hercules Motors Corporation, Canton, Ohio. Hercules engines for the construction industry are illustrated and described in this 4-page catalog. An engine chart for Hercules engines 3 to 500 H.P. is included. Hercules distributors are listed.

Highway Equipment Co., Inc., Cedar Rapids, Iowa. A 2-page catalog sheet features Hi-Way motor driven tailgate spreader. Features of the spreader are pictured and described.

Hough Co., The Frank G., Libertyville, Ill. Seven models of the Payloader tractor shovels are shown in this 4-page catalog. Line drawings and tabular information on each model are included. Payloader accessories are illustrated and described.

Huber Manufacturing Co., Marion, Ohio. A 4-page catalog on 3-wheel rollers, tandem rollers, maintainers and road graders. The equipment is illustrated and described and condensed specifications are given.

Jaeger Machine Co., 220 Dublin Ave., Columbus 16, Ohio. A 2-page catalog sheet on Jaeger construction, paving and industrial equipment. Illustrated and described are compressors, pumps, mixers, aggregate spreaders, screed finishers and concrete spreaders.

Joy Manufacturing Co., Henry W. Oliver Bldg., Pittsburgh 22, Pa. This 8-page catalog contains illustrations and descriptions of rock drilling equipment, compressed air power equipment, electric power transmission and lighting equipment, core drilling equipment and hoisting equipment.

Keystone Asphalt Products Co., 101 East Ontario St., Chicago 11, Ill. A 2-page catalog sheet on Keystone asphalt products, including fiberglass expansion joint and edge insulations, tongue and groove joint, asphalt expansion joint, dummy joint and sealing compound.

Leece-Neville Co., Cleveland 14, Ohio. A 4-page catalog on electrical equipment, including alternator systems, generators, starting motors, regulators, switches, and fractional HP motors.

Le Roi Co., Milwaukee 14, Wis. An 8-page catalog contains descriptive matter and illustrations of air compressors, rock drills, wagon drills and power units. Two pages, devoted to Le Roi tractor-tractor-compressor unit, show applications and attachments.

Lincoln Engineering Co., St. Louis 30, Mo. Heavy duty lubricating systems for contractors are covered in this 4-page catalog. Descriptions and illustrations, including line drawings, and specifications, are given.

(List to be concluded in May issue of ROADS AND STREETS)

Appointed Director of Advertising, Poor & Company, Chicago, Ill., has appointed W. A. Rundquist, of Minneapolis, to the position of director of advertising and public relations. Mr. Rundquist will maintain his residence in Minneapolis, where he is also sales promotion manager for Pioneer Engineering Works, a subsidiary of Poor & Co.



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Notes on Equipment and Materials For ENGINEERS AND CONTRACTORS

1

Water Repellent for Masonry

Start of national distribution of Daracone, a high silicone content water repellent for exterior masonry manufactured by Dewey and Almy Chemical Co., has been announced. Used on above-grade masonry, Daracone is stated to penetrate the surface leaving no film to wear away, peel or scale off. It cannot be dissolved by water, will not oxidize with age and has an effective life of from 5 to 10 years. Dewey & Almy Chemical Co., 62 Whittemore Ave., Cambridge 40, Mass.

2

18-Ton Dump Truck

A new model Sterling-White 18-ton dump truck, announced by Sterling Di-



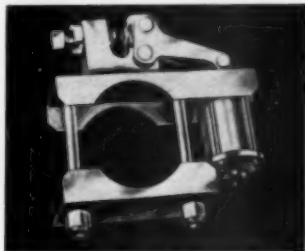
Sterling-White 18-Ton Dump Truck

vision of the White Motor Co., features a planetary-drive type rear axle equipped with the Sterling-White super-traction differential. A Sterling-White development, this special differential divides the power delivered to each rear wheel according to the grip dictated by road and load condition. Also incorporated in the Sterling-White Planetary-Drive rear axle is the "Tri-Pinion Drive." This gear arrangement, with the internal ring gear rotating around the sun gear and the idler or intermediate gears rotating on fixed centers, permits using larger and huskier gears within the available space. In addition the power is applied at a greater radius from the wheel center. The truck has a 161 in. wheel base and a hydraulic power-actuated steering gear. It has a range of ten forward speeds. The White Co., Cleveland 1, O.

3

Mounting Clamp for Vibrators

An air operated mounting clamp announced by Viber Co. is designed to speed up attachment of external vibrators to load. The clamp is claimed to be extremely advantageous when only short periods of vibration are required. No lengthy installation is necessary as air pressure applied first to the clamp causes specially de-



Air Operated Mounting Clamp

signed jaws to grip securely on to suitable steel member such as exposed angle. This requires only a few seconds and air can be applied to the vibrator immediately for whatever period vibration is necessary. Viber Co., 726 South Flower, Burbank, Calif.

4

Radio Communications Receiver

A new, simplified radio communications receiver, announced by Motorola's Communications and Electronics Division, incorporates only 14 standard and easy-to-

easy? just look! simple as A-B-C

TILT-LOAD - ON YOUR WAY



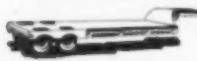

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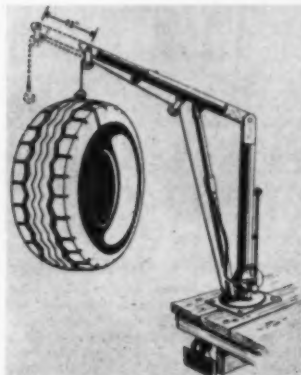
State _____

obtain tubes and has been shown to provide improved performance. The receiver, already in production for use with 2-way mobile radio systems, uses only five different tube types. The components and wiring have been simplified so that all terminals and service points are fully available without removing or relocating other components or wiring. This new unit is fully interchangeable with previous models now in operation, and is being supplied in all current shipments. Spurious and image response has been improved to the point of greater than 100 db. of rejection. The control oscillator circuit maintains increased stability over wide voltage fluctuations and is tunable over greater frequency ranges than previous models. The unit is constructed so that with a simple inexpensive exchange of the permanently tuned Permakay filter, split-channel operation can be achieved when such operation is an authorized reality. Motorola Communications and Electronics Division, 4545 W. Augusta Blvd., Chicago 51, Ill.

5

Boom Extension for Unit Hoist

A 12 in. boom extension, increasing load travel of Unit utility hoist from 77½ to 97½ in., announced by Unit Manufacturing Co., permits special handling operations such as setting pipe, working in manholes, setting water hydrants, reaching over obstructions and



Unit Utility Hoist With Boom Extension

the like. A new sheave attachment—optional at extra cost—increases load travel an additional 25%. Lifting is done by a wire cable which is secured to a clevis attached to the lower end of the hydraulic cylinder and run through a sheave at the boom end. The hoist is fully hydraulic in operation, and its design permits quick transfer from truck bed to floor frame for shop use. Unit Manufacturing Co., 1229 Harmon Place, Minneapolis 3, Minn.

6

Load-Booster for Trucks

A new line of pusher type, super Load-Booster third axle units has been announced by Detroit Automotive Products Corporation. The units are engineered for truck chassis with 34½ in. and 36½ in. frames. A feature of the units is the newly designed Torq-Leaf spring suspension, which can take motors of any torque capacity so long



It's easy dozing with Baker, Allis-Chalmers matched equipment—either for dozing, gradebuilding or ripping roots and rocks.

The "move-more-dirt" curve of Baker's famous involute blades, added to the design feature which puts the tractor weight on the cutting edge, leaves maximum power for push. These Baker features help make the Baker, A-C team the most maneuverable—the most easily operated, and thus by far the most *productive* of all earth moving equipment.

Don't settle for anything less than Baker, A-C! See your Baker, A-C dealer. Get on the bandwagon and see for yourself—

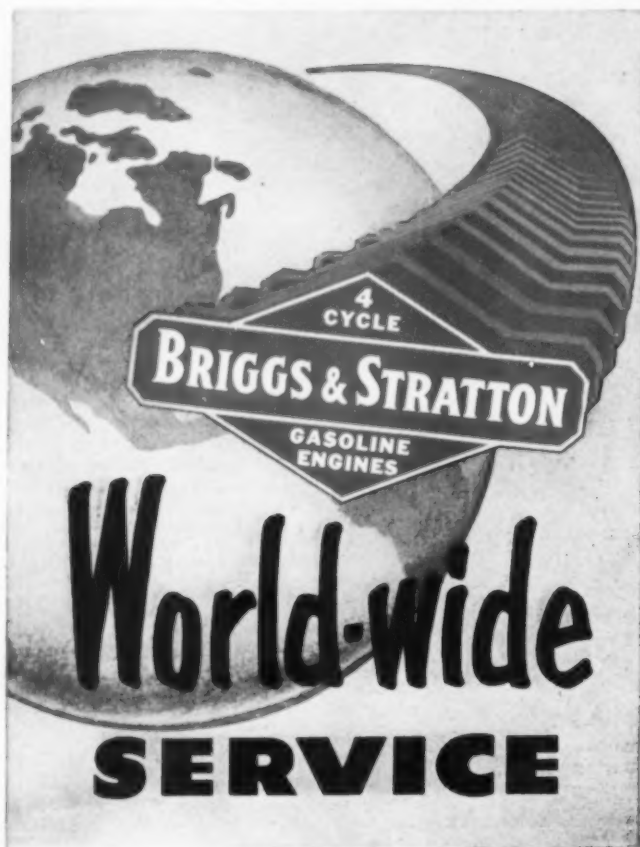
THE BAKER MANUFACTURING CO.
Springfield, Illinois

Wherever you see the Baker, A-C team at work, you see action like that pictured above, in photos of a conservation job near Lanark, Illinois. It's an Allis-Chalmers HD-9 with Baker Bulldozer.

Thar she rolls!



P. S. Have you seen the new 9-X no push beam dozer?

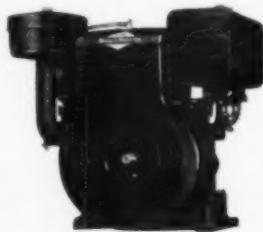


World-Wide SERVICE

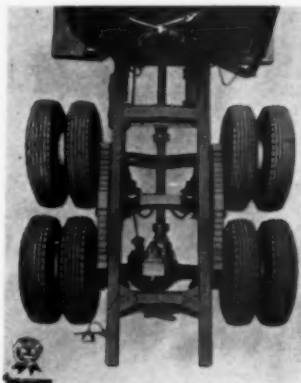
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In the automotive field, Briggs & Stratton is the recognized leader and world's largest producer of locks, keys and related equipment.



Super Load-Booster

as the gross weight on the Super Load-Booster bogie axles does not exceed the rated capacity on each model. The spring now consists of 9 plates $3\frac{1}{2}$ in. wide by $\frac{1}{2}$ in. thick. A flat plate spring clamp with wedge block adjustment and tight, double-wrapped spring eyes, is claimed to enable these heavy duty walking-bear springs to give unusual, soft riding qualities. Detroit Automotive Products Corporation, Detroit, Mich.

7

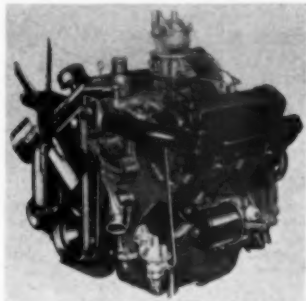
Magnifier Spotlight

A spot light that magnifies 7 times has been placed on the market by Abbecon Supply Co. This Flash-O-Lens is an illuminated magnifier. It spotlights the work it magnifies. It permits quick, accurate inspection even in the darkest corners. It is portable, simple to operate and uses standard dry cell batteries. Abbecon Supply Co., 179 Jamaica Ave., Jamaica 32, N. Y.

8

Heavy-Duty Industrial Engines

Three new heavy-duty industrial engines designed for greater efficiency, performance and operating economy are being produced by Ford Motor Co. Also available is a new Ford multi-torque converter. It is claimed to offer all the advantages of a fluid coupling plus torque multiplication, and is designed to absorb shock overloads, prevent stalling under excess loads and start bigger loads faster. The new engines are the Ford "317," the Ford "279" and the Ford "215." The numbers identifying each engine corre-

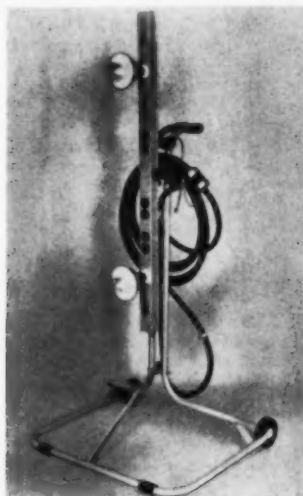


The "317" Ford Engine

spond to its displacement in cubic inches. The "317" is rated at 140 brake horsepower at 2800 rpm. It is a V-8 with 3.8-in. bore and 3.5-in. stroke. The "279" is rated at 125 brake horsepower at 2800 rpm. It also is a V-8 and has a 3.56-in. bore and 3.5-in. stroke. The "215" is a 6-cylinder engine rated at 93 brake horsepower at 2800 rpm. It has a 3.56-in. bore and a 3.6-in. stroke. Ford Motor Co., Dearborn, Mich.

9 Power and Light Head

A new series of devices announced by National Electric Products Corporation provide a power and light head (illustrated herewith), a lighting head with four sockets, on a four-socket infra-red spreader. Carriage mounted on a light all-steel tubular frame, the strip carry-



NE Rolla-Duct Power and Light Head

ing sockets and outlets, is mounted on a ball-and-socket assembly that may be locked in any desired position, vertical or horizontal. The 3 ft. 10 in. strip of No. 1700 Surfaceduct, which is fully grounded and which incorporates a circuit breaker for full worker protection, also may be raised to a height of 6½ ft., or when the carriage is collapsed, may be rolled under a job, furnishing power and light right at the point desired. The carriage-mounted units carry an approved rating for 20 ampere loads for 115 or 120 volt operation and are designed as portable branch circuit extensions that literally roll power, light or heat to any location, increasing the service area of permanent electric outlets to a radius of 20 ft or more. National Electric Products Corporation, Chamber of Commerce Bldg., Pittsburgh 19, Pa.

10 Earthmover

Commercial models of the 2C500 Heilliner are now available. During the past year the units have been built exclusively for the Corps of Engineers, U.S. Army. The unit is equipped with a 13 cu. yd. scraper. Features include Heil's exclusive Hydro-Steer, unobstruct-

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Model 2C500 Heiliner

ed visibility, big, safe, heavy-duty 2-shoe air brakes synchronized on both the tractor wheels and the trailing unit wheels, and speeds up to 25 miles per hour, even when loaded. A 105 H.P. Model HRB600 Cummins diesel engine powers the 500 Heiliner. The Heil Co., Milwaukee 1, Wis.

(Continued on page 104)

National Highway Promotion Program Undertaken

With a view to the co-ordination of the efforts of all groups concerned with the correction of the critical deficiencies of the nation's roads and streets, a temporary operating body known as the National PAR Committee, was set up at a meeting held in New York on February 28. Forty national organizations co-operated in its formation.

The temporary operating PAR committee is composed of Paul B. Reinhold, president of the Atlas

Equipment Corporation and of the American Road Builders' Association; L. S. Wescoat, president of the Pure Oil Company and chairman of the board of the American Petroleum Institute; Albert Bradley, executive vice-president of the General Motors Corporation and chairman of the National Highway Users' Conference; and Arthur M. Hill, president of the National Association of Motor Bus Operators. Arthur C. Butler, director of the National Highway Users' Conference, was elected permanent secretary.

This new effort at improvement of the highway situation of the country is the first nationwide good roads movement undertaken in more than a quarter of a century. The word "PAR" in the committee's name was chosen to represent the objectives of the program, "Project—Adequate Roads."

The next meeting of the committee will be held at noon, May 6 at the Mayflower Hotel in Washington, the first day of the Fourth Highway Transportation Congress.

Illinois Decision Upholds New Truck Fees

Holding that the new truck licensing law does not levy excessive fees, the Illinois Supreme Court on March 20 upheld the new legislation which will bring an additional \$20 million per year of highway funds. "The heavy cost of maintaining the state's arteries of transit must be borne by someone," said the judicial opinion. "The General Assembly could, as it did, place a large share of this burden of expense upon those who own and operate such heavy vehicles as trucks and buses . . . It cannot be said that a tax on the privilege of using the highways is unreasonably high when that tax does not even equal the total cost of their maintenance."

The law which raised truck licenses as much as 300% in some heavy weight classifications had been declared unconstitutional by a judge in a lower circuit court last November, and the state was then joined by an injunction from collecting these taxes pending a recent final decision.

Did You Know That a prestressed concrete bridge has the following advantages?

- Eliminates structural steel.
- Permits reasonable length for H-15-44 loading.
- Eliminates expense of scaffolding and extensive forming on the job.
- Eliminates maintenance painting.
- Requires no priority steel.
- Is easily and speedily built.
- Employs simplicity of construction.

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IN EVERY CHANNEL OF OPERATION!

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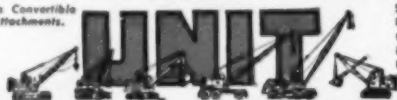
- ★ UNIT 357 Mobile Type
1/2 Yard Excavator
Crane up to 9 tons.
- ★ UNIT 614 Crawler Type
1/2 Yard Excavator
Crane up to 8 tons.
- ★ UNIT 1020 Crawler Type
1/2 Yard Excavator
Crane up to 10 tons.
- ★ UNIT 1520 Mobile Type
1/2 Yard Excavator
Crane up to 20 tons.
- ★ UNIT 1014 Truck Crane
1/2 Yard Excavator
Crane up to 12 tons.
- ★ UNIT 1520T Truck Crane
1/2 Yard Excavator
Crane up to 20 tons.

All Models Convertible to ALL Attachments.

SEE this modern 1/2 yard excavator perform and you'll see high efficiency and versatility coupled with low maintenance cost. The Unit 614 combines speed, power, and finger-tip responsiveness. It has the same rugged construction usually found in machines of greater capacity. Check these life-prolonging features: One-piece gear case . . . Twin hook rollers . . . Automatic traction brakes . . . Drop forged gears . . . Invaluable splined shafts . . . Disc type clutches . . . Straight-in-line mounting of engine and main machinery. Streamlined FULL VISION CAB provides 360° visibility. Keeps both man and machine operating at top efficiency. Promotes safety. Write for Catalog No. 5000.

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ROADS AND STREETS



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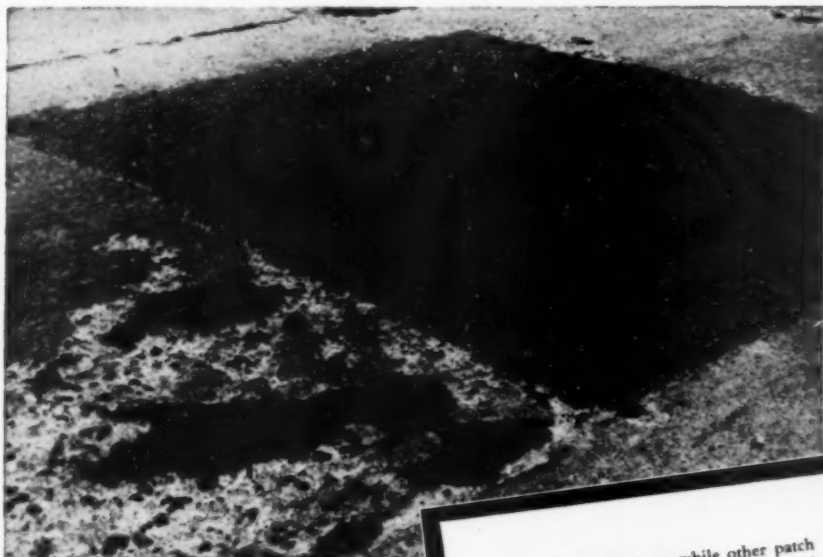
★ Yesterday vs. Today: How U.S. South of Alexandria, Va., looked recently, compared with the same location in 1913. (See notes on page 110) U.S. Bureau of Public Roads Photos.

**Double Rail Loop Feature of this Asphalt Plant
Importance of Proper Temperature for Hot Mixes**

New Equipment and Material for Road Builders

APRIL, 1952

You can use **Komac*** Premix in any weather



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● With this remarkable new road patching and paving premix you can repair and resurface all year round . . . rain or shine, hot or cold. Just sweep out the hole and patch with KOMAC Premix . . . compact it thoroughly, then open to traffic.

KOMAC Binders, offered exclusively by Koppers, mix easily and quickly with local aggregate. Since KOMAC Premix stays workable in the stockpile for a year or more, it is immediately available for use when you need it most. Send for free booklet. It will be helpful in setting up an all-weather repair and construction program.



KOMAC is still intact, while other patch mixes in foreground have been displaced and worn away. KOMAC is uniform and skid resistant, yet "tight".

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TARMAC resists the stripping action of water . . . even withstands the softening effect of gasoline and oil drippings.

You can speed up construction work with TARMAC because it penetrates quickly into roadbeds, mixes easily with local aggregates, adheres quickly and cuts through dust or moisture films to coat the aggregate.

KOPPERS COMPANY, INC., Tar Products Division, Dept. 432-T, Pittsburgh 19, Pa.

DISTRICT OFFICES: BOSTON, CHICAGO, LOS ANGELES, NEW YORK, PITTSBURGH, AND WOODWARD, ALA.

Barber- Greene

PORTABLE CONVEYOR

MODEL
363

Complete accessories are available to make the 363 Conveyor adaptable to the widest variety of operating conditions. It is shown here unloading a hopper car with a B-G 358 unloader.



HANDLES ALL MATERIALS: Sand, stone, gravel, wet concrete, chemicals, coal, etc.
UP TO 200 T.P.H. CAPACITY: Available in lengths of 25', 30' and 35', plain or cleated 24" belt.

NO CHAINS, NO SPROCKETS: Power transmitted from gear reducer through shaft to the head-end drive—sturdy, maintenance-free construction.

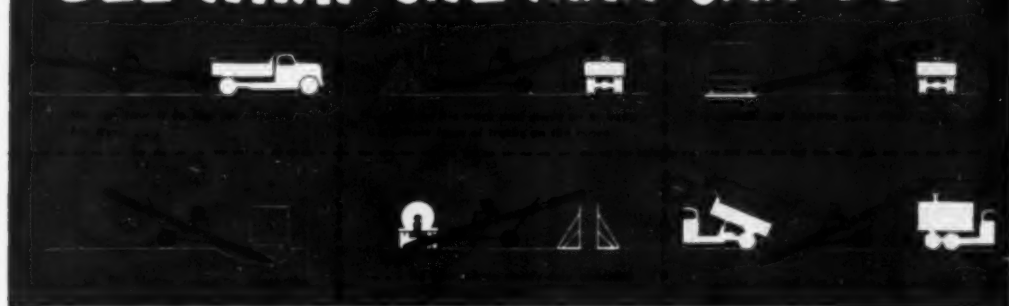
25 MILES PER HOUR TOWING SPEED: Pneumatic tires, coil springs, shock absorbers, convenient towing hitch.

RUGGED B-G CONSTRUCTION: Designed for maximum strength, minimum weight.

FULL SWIVELING WHEELS: For radial stockpiling as desired.

ALL PURPOSE: Built for contractors, material yards, concrete product plants; aggregate plants, gravel pits, City, County and State Highway Departments, etc.

SEE WHAT ONE MAN CAN DO...

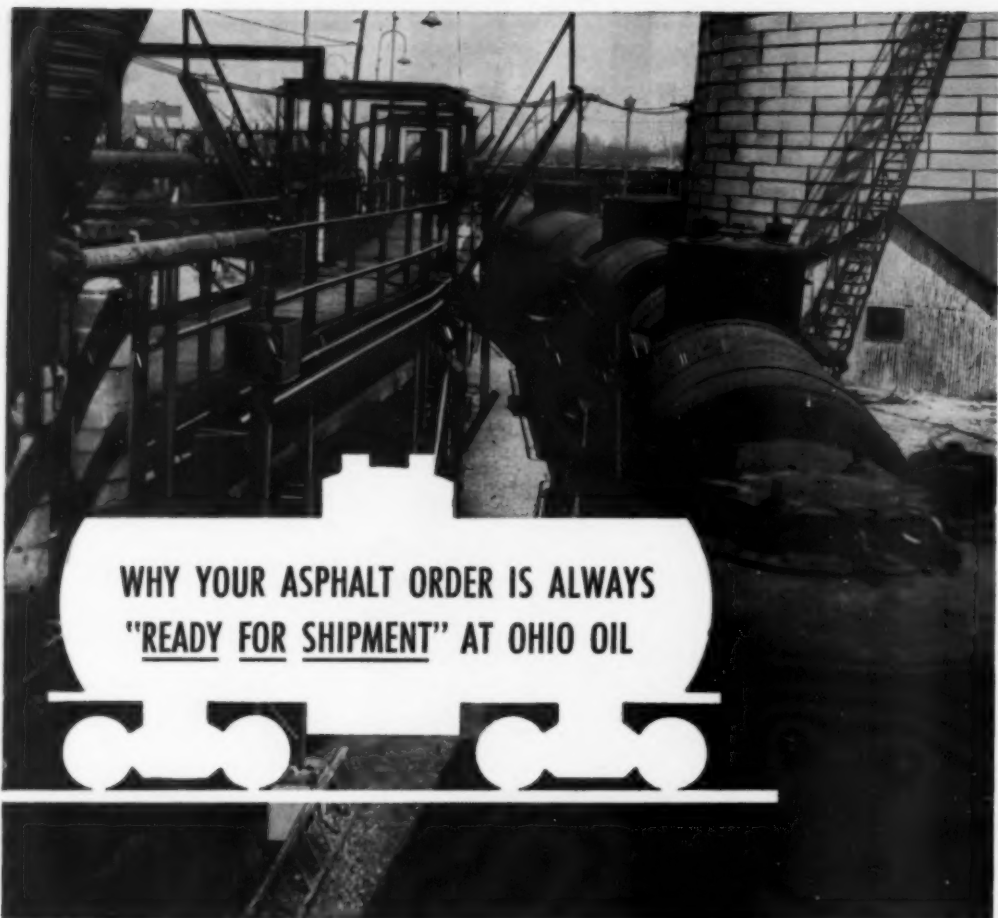


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87



WHY YOUR ASPHALT ORDER IS ALWAYS
"READY FOR SHIPMENT" AT OHIO OIL

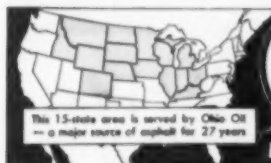
Here's why you can count on flexible, ON-TIME deliveries . . . even during peak seasons

There are over 30 good reasons why your asphalt order can be filled immediately. For Ohio Oil, with its tremendous crude resources and refinery and storage capacities, keeps that number of different types and grades of asphalt on tap at all times!

There are hundreds of good reasons why your order gets under way fast. For Ohio Oil has

a plentiful supply of tank cars, and more-than-adequate loading facilities.

And the one big reason you can keep delivery dates *flexible* is Ohio Oil's direct, unified, one-company operation. Almost without exception, you can *speed up* or *hold up* shipments to meet local job conditions with *one phone call*. Worth remembering this summer, isn't it?



Contact nearest office for all grades of asphalt and asphalt cements

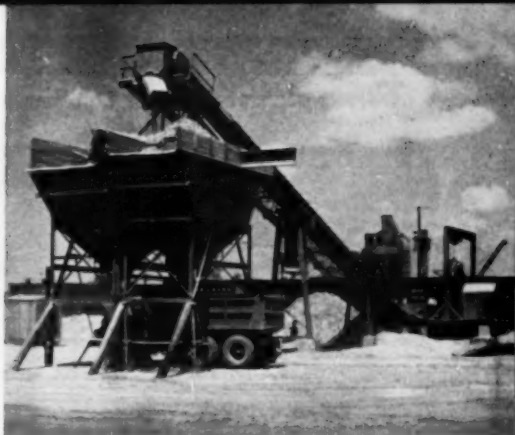
The OHIO OIL Company

ASPHALT DEPARTMENT

FINDLAY, OHIO • LOVELL, WYOMING • Producers of Petroleum since 1887



★ Mechanical car shaker in action, speeding the unloading of base stone from cars on the outer rail loop



★ Stone from the mechanically shaken cars are belted to this batching station for truck loading

Double Rail Loop

SPEEDED ASPHALT PRODUCTION AND STONE HANDLING ON TURNPIKE JOB

Plant which produced hot mix and dispatched base stone for 18-mile turnpike section during 1951 season is described here, along with notes and photos covering selected details of paving placement

AN unusual scheme for handling aggregates was the feature of a plant operated during the past season near Barrington, New Jersey. The plant represents the joint effort of Savin Construction Corporation, prime contractor (Contract 60) for pavement on Section 2 of the New Jersey Turnpike, and Kelley & Meyer Co., of Youngstown, Ohio, subcontractor for producing and placing the asphaltic concrete.

Most conspicuous part of the layout was a double-track rail "loop," having 11,000 ft. of track which encircled the two asphalt plants and surrounding stockpile and work area. The loop, roughly sketched and pictured here,

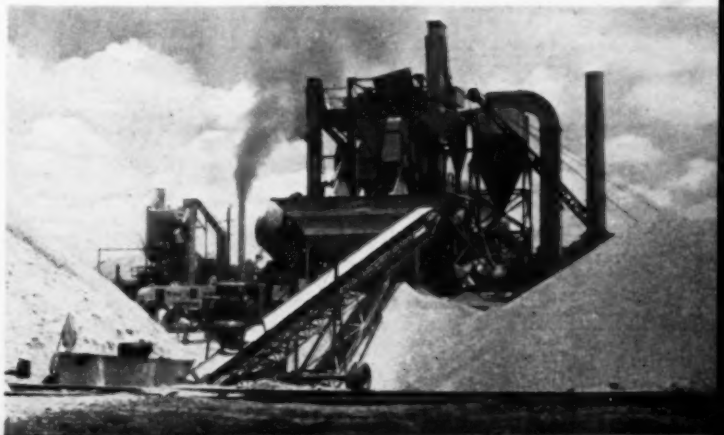
was built in cooperation with the railroad company, whose line it tapped. Rail delivery and unloading of aggregates at the rate of 100 or more 50-ton rail carloads per day—required to meet schedules—were easily possible under this scheme, cars being moved to position over one of the three car-dumps by tractors working with the usual cable slings. Sixty cars could be accommodated in the loop at one time.

Contract 60 covered all paving oper-

ations for 17.9 miles of 4-lane-divided turnpike. Main roadway paving alone totaled 583,000 sq. yd., requiring over 140,000 tons of hot mix for the three 1½-in. courses. Stone for the 7½-in., 2-course penetration macadam base under the main roadway totaled another 225,000 tons. Ramps, side road connections and special paving added to these tonnage figures.

Crushed stone was supplied via rail ferry over the Delaware River from the Downingtown, Pa., plant of Con-

★ In foreground is the inner track, and one of two under-car unloading docks embodying portable conveyor units, for stock-piling hot-mix aggregates adjacent to the plant bin



Details of Asphalt Plant Equipment, Contract 60, Paving Section 2, New Jersey Turnpike

(Savin Construction Corporation, Contractor; Kelley-Meyer, Subcontractor)

Plant	Simplicity S-88	Simplicity S-100
Cold Stock		
No. bins	3	3
Type bins	Erie	Blaw-Knox
Capacity bins	30 t. each	100 t.
Type of feed, bins to drier	Continuous apron	Continuous apron
Drying Unit		
Number	1	1
Size drier	8' x 12' dbbl. shell	10' x 20' dbbl. shell
Type drier	Simplicity	Simplicity
Type drive	Chain; diesel	Chain; diesel
Speed and pitch of drier	Level—8.75 rpm.	Level—8.75 rpm.
Type of burners	Hopkins Volcanic	Hopkins Volcanic
No. burners	2	2
Type fuel	No. 5	No. 5
Type temp. control and location	0°—800° F. @ 10° interval dial. Brown thermocouple	0°—800° F. @ 10° interval dial. Brown thermocouple
Hot Storage Bins and Screed		
Type and size of hot storage	Link-Belt 9' x 16' x 6" buckets	Link-Belt 9' x 16' x 6" buckets
Type of screens	Symons-Nordberg 2 deck	Symons-Nordberg 2 deck
No. of screens	4	4
Screen pitch	Level	Level
Screen sizes	No. 1—4' x 7' No. 2—4' x 7' No. 3—4' x 4 1/2' No. 4—4' x 5'	No. 1—5' x 6' No. 2—5' x 6' No. 3—5' x 6' No. 4—5' x 6'
No. of bins	4	4
Capacity bins	15 t. each	15 t. each
Type discharge	Roller slide 2-batch	Roller slide 2-batch
Weigh Box and Aggregate Scales		
Capacity of weigh box	5000 lb.	5000 lb.
Type discharge	Swing gate	Swing gate
Type of scales	Full width Hardy	Full width Hardy
Capacity of scales	5000 lb.	5000 lb.
Sensitivity	5 lb.	5 lb.
Asphalt Scales and Bucket		
Type of scale as meter	Yale	Yale
Capacity of scale as meter	500 lb.	500 lb.
Sensitivity	1 lb.	1 lb.
Type and size bucket	500 lb. barrel-type	500 lb. barrel-type
Type discharge	T-valve ram control	T-valve ram control
Type temp. control and location	Asphalt bucket 0°—500° F.	Asphalt bucket 0°—500° F.
Dust Collector		
Manufacturer	Simplicity	Cyclone
Mixer		
Type	Twin pug	Twin pug
Capacity	4000 lb.	5000 gal.
No. blades	64 run-around	64 run-around
Blade clearance	1/2 in.	1/2 in.
Type and operation of discharge	Double gate ram control	Double gate ram control
Mixing time control	Hardy	Hardy
Method and Capacity of Storage		
Asphalt Storage		
Type of tanks	Cyl.-hor.	Cyl.-hor.
No. and size of tanks	1—16,000 gal. 2—12,000 gal.	16,000 gal. 12,000 gal.
Method of heating and circulating		
No. of coils	Steam coil	Steam coil
Method of discharge	364' of 1 1/2" steel coils	364' of 1 1/2" steel coils
Stone Car Unloading	Kinney pump	Kinney pump
Penetration macadam stone		
	Under-car bin and grating	
	Allis-Chalmers car shaker	
	Simplicity feeder	
	Barber-Greene 30" x 175' belt conveyor	
	2—50 ton bins	
	Barber-Greene conveyor at each of two unloading stations	
Hot coarse aggregate		
Sand Delivery		
By truck from commercial pit		

crete Materials and Construction Co.* Sand for the asphaltic concrete mix was trucked in from local sand plants, independent of the rail spur operation here described.

While the rail layout was designed to permit flexible use, in general the outside track was used to deliver 3 1/2" and 2 1/2" stone for penetration base construction. Cars in strings of as many as 10 were moved to position, one by one, over an unloading dock, where an Allis-Chalmers electric vibratory car shaker was used to speed unloading of gondolas. A 50-ton car was unloaded every 8 minutes at top going. Stone from bottom-hopper cars dropped through a grating onto a Simplicity mechanical feeder, passing thence to a Barber-Greene 175' x 30" belt conveyor and into a 2-compartment bin for trucking either to the job or to stockpiles.

Stone of 3/4-in. maximum size for asphaltic concrete was stockpiled from the inner loop. Two car dumps served here, one for each asphalt plant, each including a Barber-Greene conveyor and a car unloader.

Two Asphalt Plants

The asphalt plants consisted of 150-ton and 100-ton per hour Simplicity units, each complete with Hardy automatic-electric batching controls. For the 100-ton plant one International UD 18A diesel unit powered the blower, and two similar units ran the mixer and drier via Falk drive and V-belt. The 150-ton plant was similar in design. Details of both plants are given in the accompanying tabulation.

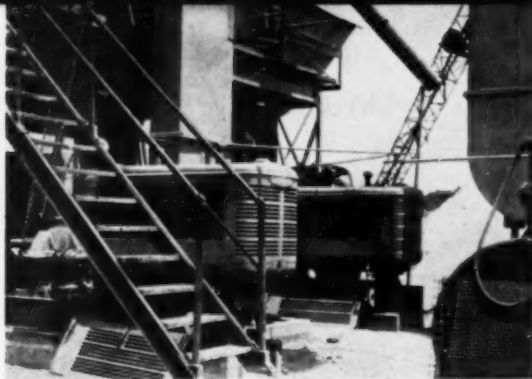
Asphalt concrete production control followed a procedure adopted as standard for the various turnpike paving sections.** The two plants combined produced over 2,000 tons of mix per day, working usually 10 hours during the season's peak. The biggest day was 2,400 tons in 10 hours with 2 plants and 1,606 tons in 10 hours with the larger S-100 plant alone.

*See article, "650,000 Tons of Aggregates," Roads and Streets, December, 1951.

**As detailed in article, "Paving 46 Miles of Turnpike from a Single Plant Set-up," Roads and Streets, September, 1951 (covering Turnpike paving sections 3 and 4).

★ Panoramic view of the "rail loop". Railroad main line seen at the left





★ Nearest power unit operates the pugmill, other unit the blower; 100-ton plant



★ Another view of the 100-ton plant showing compact arrangement storage tanks

Notes on Paving

Paving operations called for constant scheming to dovetail the work of subbase reshaping, subbase gravel placement and rolling, placement and rolling of penetration base stone for each of the two courses, distributor operation, chip application, and finally, placement of the three courses of asphaltic concrete. Delays at bridges and simultaneous work of placing additional drainage also complicated the planning, as did last-minute corrections of subgrade and subbase.

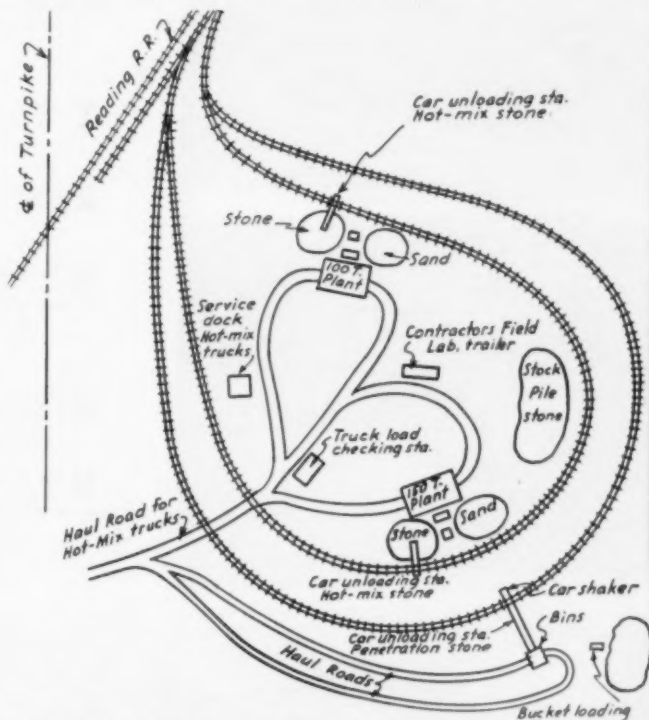
Savin Construction Corporation performed the subbase and base work, with Barrett Paving Co., of Trenton, subcontracting the placement of liquid asphalt for penetration. Savin had on hand a fleet of about 35 Mack trucks with 20-ton Heil bodies for delivery of penetration stone. The penetration base consisted of a penetrated and choked course 4½ in. thick by 25 ft. 9 in. wide and a second course 3 in. thick by 25 ft. 0 in. wide. Schedules called for placing 5,000 to 6,000 lin. ft. of base course per day. Two Adnan spreaders and necessary rollers were used.

Barrett Paving Company's penetration work was performed largely by two Etnyre 2,500-gal. distributors served by highway tankers hauling direct from the refinery or from storage tanks at Philadelphia. Barrett supplied some 3,000,000 gal. of penetration asphalt in all for the 1.75 gal. per sq. yd. application for the first course, and the 1.75 gal. per sq. yd. application plus .30 gal. second appli-

cation for the second course over this 17.9 mile section.

(The second or .30 gal. application and choke were required after the first

(Article continues on page 94. See next spread of pages for photos of penetration base and asphaltic concrete placement details).



★ Rough sketch of the "loop" layout (not to scale)





On the N.J. Turnpike with Savin and Kelley-Meyers

Methods depicted here were typical of those used by the various contractors on the New Jersey Turnpike. The turnpike engineers stressed the importance of thoroughly taking the wrinkles out of the subbase and base, as the best means of meeting the rigid tolerances in the asphaltic concrete courses. Also the importance of pre-testing each layer for weak spots, by means of passage of heavy rubber tired compactors or hauling equipment, was confirmed in the season's experience.
—Editors.



1 Last minute ditching and berm dressing on the Savin section

2 How Savin hauled drainage pipe, installed as part of turnpike surfacing contract



3 The Turnpike engineers, in supervising spreading of the base stone, were principally concerned with avoiding segregation. The contractor's chief problem was to control the spread so that little or no hand shoveling would be necessary to arrive at correct rolled thickness

4 Digging out pockets in base stone which did not meet the inspector's approval

5 The Savin stone trucks were routed systematically over the stone base courses to help secure the required density and to act as a "pre-testing" operation

92





6 Checking the subgrade for final elevation before beginning placement of penetration base stone. Liquid asphalt for penetration was supplied to the distributors by 2500-gal. tankers



7 Kelley & Meyer used several Hauck asphalt tool heaters



8 Applying asphalt at rate of 1.75 gal. per sq. yd. to lower base course. Note how base stone is supported at the edge by shoulder material Etnyre unit

9 Big tankers supplied 3,000,000 gal. of liquid asphalt to the distributors for Section 2 paving



10 Following chip application to second penetration base course, Savin Const. Co. used a broom drag with Oliver tractor to aid uniform chip distribution and to meet the $\frac{1}{4}$ -in. smoothness tolerance for this layer



11 This 10-ft. straight edge proved highly successful for checking evenness of the asphaltic concrete during rolling. (Another contractor had a similar one 16 ft. long). High or low spots were revealed by the floating middle wheel, which actuated a battery-powered buzzer whenever it rose or settled over an uneven place. The operator here is marking a low spot with an "L" for correction

12 Three Axle Buffalo-Springfield rollers figured prominently in securing the final meeting the $\frac{1}{4}$ -in. final surface tolerances for the top course





★ (Left): Plant operator working the electric automatic batch controls. (Right): Heating units of 100-ton plant. Two oil burners and fuel pressure gage

(Continued from page 91)
application had cooled, as a means of filling voids produced by shrinkage of asphalt in the cooling.)

Twelve steel rollers were employed for penetration base and asphaltic concrete rolling. These included six 3-axle Buffalo-Springfield rollers, four 2-axle tandems and three 3-wheel rollers, the latter two types being Huber and Galion units.

Bituminous concrete was placed in the three 1½-in. layers using two

Barber-Greene finishers in echelon to complete each course full width. Two such pairs of machines were kept in operation.

A noteworthy detail of Savin's work was the practice, used successfully with Turnpike permission, of rolling penetration stone immediately in the wake of the distributor and before chip application. This measure produced satisfactory densification of the course. By further compressing the stone it also was said to result in a

slight saving in the asphalt gallonage needed to secure full penetration and otherwise meet all specifications.

The firm of Gannett, Fleming, Corddry and Carpenter, Inc., Harrisburg, Pa., was the Section Engineer on Turnpike Section 2, with Frank J. Williams, project manager; S. G. Nowell, resident engineer; H. S. Matimore, asphalt consultant; Robert H. Thomas, asphalt technician; and E. J. Davis, engineer. L. F. McCarthy was project manager for Savin Construction Corporation. R. P. Shorts was project manager and J. R. Reddick, asphalt technician, for Kelley & Meyer Co., with Clyde Claybaugh plant superintendent.

With the Manufacturers

Hartzell Named Sales Manager. John A. Hartzell, heretofore assistant sales manager, has been named sales manager, Engineering and Construction Division, Koppers Co., Inc., Pittsburgh, Pa.

New President American Bitumals. C. W. Turner has been elected president of American Bitumals and Asphalt Co., San Francisco, Calif., and C. W. Stewart has been named to the newly-created position of vice-chairman of the board of directors. Mr. Stewart has been president of the company, a subsidiary of Standard Oil Co. of California.

Edwards Elected President Reilly Tar. Carleton B. Edwards has been elected president of Reilly Tar and Chemical Corporation and Republic Creosoting Company, succeeding Peter C. Reilly who died on Jan. 4. Other officers of the Companies are P. C. Reilly Jr., vice president and treasurer; T. E. Reilly, vice president and production manager; and R. J. Wechsler, secretary.



★ The contractor's mobile field laboratory was located between the two plants in the loop area, accessible to the haul roads

★ Gondolas were moved ahead in clips of 5 to 10 for unloading. Note how inner and outer tracks were spread out to provide ample working space between



New Emulsion Plant Typifies Growth of Asphalt Paving Field

Indicative of the growth in the use of asphalt emulsion, a new emulsion plant has recently been placed in operation at Catlettsburg, Kentucky. Starting production during the summer of 1951, this plant is capable of producing in a single day as much as 120,000 gallons (or 12 rail carloads) of material meeting all the present specification requirements for both the oil-in-water and the inverted cut-back types of asphalt emulsions.

This newest plant of Ashland Oil and Refining Co., is located at the firm's Ashland refinery and is designed to serve the Ohio Valley and surrounding region. The company was motivated in this new venture by the important and growing place in the paving field being taken by emulsified asphalt products. According to Ashland engineers, asphalt emulsion—an asphalt cement finely dispersed in water—has certain distinct advantages, particularly those of high fluidity which obviates heating before application, and the ability to coat damp aggregates. Asphalt emulsions are being specified for penetration macadam, seal coats or surface treatments, tack coating, and stabilization of soil-aggregate base courses.

The new plant, said to be one of the most modern in the industry today, combines the Lancaster high-speed gear type disperser with the principle of continuous proportioning and operation, along with the latest material handling equipment and controls.

The complexity of this new unit is indicated by the varied equipment incorporated. The plant utilizes 15 tanks for processing and storage, 8 of which are equipped with electric propeller type mixers; 1800 ft. of inter connecting line, mostly steam-jacketed; 75 manually controlled and 8 automatically controlled valves, and two large instrument panels. These panels have automatic remote control switches for handling the 150 or more kilowatts of electric power required for the 17 electric motors, $\frac{1}{2}$ to 60 hp. The set-up involves a complete soap manufacturing and water softening unit. A 950-ft. steam-jacketed overhead line carries hot asphalt from the refinery to the emulsion unit, providing for a constant and integrated supply.

Five operators and two laboratory workers trained at the unit, keep the plant running. Refinery control

chemists at the main asphalt laboratory are also being trained to handle the additional tests imposed in conjunction with the shipment of asphalt emulsions. Supervision includes two chemical engineers and three chemists, plus four senior analysts, making technical assistance available to customers at all times.

Pioneer Acquires Jaeger Paver. Pioneer Engineering Works, 1515 Central Ave., Minneapolis, Minn., subsidiary of Poor & Co., Chicago, has acquired by purchase from Jaeger Machine Co., Columbus, O., its Model BP-5 Bituminous Paver. Through this acquisition, Pioneer secured the exclusive right to manufacture this paver under the various patents applicable thereto. The new equipment will be built in the Minneapolis plant

and will be distributed through authorized Pioneer dealers in the United States, Canada, and throughout most of the world.

New Huber District Sales Manager. F. W. (Pete) Gillette, formerly district representative for Buda Co., has been appointed district sales manager for Huber Manufacturing Co., Marion, O. His headquarters will be 1706 Surrey Lane, N.W., Washington, D.C., and his territory includes the states of Virginia, Maryland, Delaware, New Jersey, Eastern Pennsylvania and the District of Columbia.

New Eutectic Regional Managers. Two new additional regional sales offices have been announced by Eutectic Welding Alloys Corp., Flushing, N.Y. Sales in Los Angeles and the West Coast will be supervised by Robert B. Welch. Woodrow W. Shackelford heads the new sales region for Buffalo and upstate New York areas.

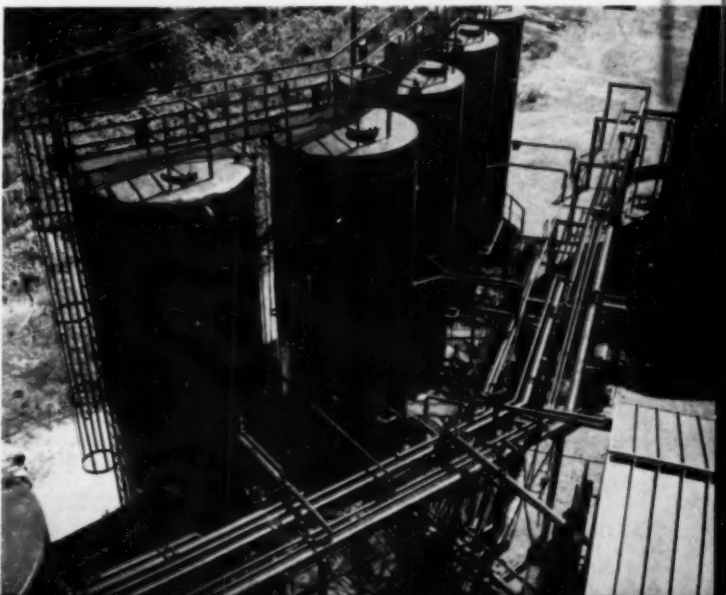
Minneapolis-Moline Appointment. Orville J. Parks, formerly production engineer for Minneapolis-Moline Co., Minneapolis, Minn., has been appointed director of the newly formed Parts Division.



★ Emulsion products tanks in foreground; basic asphalt tanks and emulsion building in background. Interior scene: high-speed disperser in background, soap plant and storage in foreground.



★ Some of the 1800 ft. of piping and 75 valves in the new emulsion plant



Temperature Control of Hot Mixes

This author warns against the common practice of specifying a maximum temperature for all asphaltic work regardless of the characteristics of the particular shipment of materials used. Mixing temperature should depend on the viscosity while mixing. This article is the outgrowth of discussions at recent mid-western Asphalt Institute conferences, in which the author's comments on temperature control aroused interest. In response to numerous requests for his remarks, Mr. Nevitt has recorded his thoughts here to meet an expressed need.—Editor

By H. G. Nevitt

Manager, Asphalt Department, Central Region, Socony-Vacuum Oil Company, Kansas City, Mo.

THE increasing use of hot mix, especially in low cost types, has been paralleled by use of a greater variety of aggregates and asphalts. Both trends have emphasized the need for greater care in the construction. While the great majority of jobs display the high quality associated with hot mix pavements, enough show distress or below normal performance to emphasize the need for materials and methods which assure the good results inherently possible.

One source of difficulty is becoming more generally recognized; namely, the possibilities of trouble due to excessive temperatures in the mixing operation. "Excessive" in this case should be defined as that temperature which depreciates the quality of the mix unnecessarily without sufficiently compensating benefits, since improper temperature control can greatly shorten the life of a pavement even though it may appear quite satisfactory at the time of laying.

The greatest danger from improper temperature control is unnecessary hardening of the asphalt. It has been well known and widely demonstrated for many years that the greatest cause of failure in bituminous pavements which did not show distress immediately after construction due to some other difficulty is the hardening of the asphalt. It has only been recently realized to an equal extent that this hardening usually occurs in the mixing operation. Much accumulated data show that the penetration drop in the few minutes of the mixing operation is often far greater than that which will occur in years of subsequent exposure of the pavement to the elements.

The purpose of this discussion is

to briefly outline the fundamentals involved in controlling the mixing temperature, and to make some suggestions as to how this situation may be satisfactorily handled without undue penalties to the construction operation. The data presented will incidentally show that the most common type of specification for this purpose (naming a maximum temperature for the work regardless of the materials used) is not a satisfactory approach.

Hardening of Pavements

As noted above, hardening of the asphalt mix is of two types. The first corresponds to the mixing operation; the second to that occurring after the pavement has been laid and continuing throughout the life of the pavement at a relatively slow rate. Since innumerable examples of pavement can be cited which are extremely satisfactory after many years of service, it is obvious that this natural hardening process need give us no concern provided suitable materials are used and proper construction methods and controls are adhered to. We do need to be certain that the pavement starts its career in the most satisfactory possible condition; this will definitely not be the case if the mixing temperature has been higher than necessary.

The reason that the hardening during mixing (occurring in the matter of seconds) may be as great if not greater, than that which takes place over a period of years after construction, is that in the mixing operation thin films of asphalt are subjected simultaneously to high temperatures and full exposure to the oxygen in the air. Few engineers realize the tremendous surface extent of the films which are actively exposed during this mixing. The area of such exposure in a single batch may be measured in acres, while the films are very thin, generally being between 0.0010 and 0.0001 inch.

Hardening of the asphalt during mixing primarily results from (1) oxidation of the asphalt and (2) loss of lighter fractions from the asphalt. Both of these phenomena are very sensitive to the temperature of the mix. Like the majority of chemical reactions, the oxidation rate roughly doubles for every 18° F. increase in temperature. This means that a batch which could be satisfactorily mixed at 240° F. (such as an airport surface using a high penetration California asphalt) but instead is heated to 330° F. (a temperature only slightly above the 325° often seen in specifications) will oxidize 32 times as rapidly. It is evident that the temperature should be held as low as possible.

The volatilization loss does not follow this same rule, but it does increase with about the same degree of rapidity. Both of these effects will cause hardening to an alarming degree if the correct temperature is exceeded to any appreciable extent. In brief, the primary factor in preventing undue hardening of the asphalt during the mixing operation is to keep the mixing temperature at the lowest possible level consistent with practical operation.

Specifying a maximum permissible mixing temperature may in some cases control this hardening. However, such a direct temperature requirement (that is, a flat specified limit) does not take into consideration the variation in asphalts from different sources with respect to viscosity temperature susceptibility or in consistency of different grades from the same source. As a result, the temperature may be set too high to prevent injury to the asphalt.

Factors Controlling Mixing

The proper mixing temperature is a function of the viscosity of the asphalt during the mixing.

If the mixing temperature is much too low (and hence the viscosity is quite high), the mixing time must be increased to obtain a thorough mix. If the temperature is too high, so that the viscosity of the asphalt is decreased below a certain point, no material increase in rapidity and ease of mixing will be obtained; this increased temperature may, however, cause hardening and injury to the asphalt. It is obvious that there is an optimum mixing temperature at

which the proper viscosity is obtained which will permit rapid, thorough mixes with minimum injury to the asphalt; and it happens that the difficulties from too low a temperature are far less serious than from one too high. This optimum mixing temperature (corresponding to the optimum mixing viscosity) will vary for asphalts of different types, from different sources, and for different grades of asphalts from the same source or type.

From careful study of the limited data then existing, it was concluded some years ago that this optimum mixing viscosity was 150 seconds, Saybolt Furol. Mixing at higher viscosities (hence lower temperatures) is readily practicable—the mixing time does not get truly excessive until the viscosity has passed several thousand seconds—but the hardening at 150 seconds is very reasonable with the great majority of asphalts so that there seems little reason to set a higher figure. On the other hand, the hardening increases rapidly as the temperature is raised and the viscosity decreased, with a viscosity of 75 seconds the desirable limit. This should not be exceeded for two sound reasons. The first is that the pavement damage may become serious. The second is that there are no appreciable benefits to the mixing from any lower viscosity; the thinner and hotter films simply harden more rapidly without improved mixing since at such viscosities the spreading of the asphalt over the surface is primarily determined by the aggregate characteristics and gradation and the wetting tendencies of that particular asphalt and aggregate. Since the original establishment of 150 seconds as the optimum temperature, much field experience seems to confirm that it is correct, and that the hardening under such mixing conditions is neither unreasonable or unjustified.

It may be desirable to emphasize that the temperature under discussion is that of the mix rather than the asphalt before its addition to the aggregate. The temperature to which the asphalt can be heated for easy handling in the plant can be that found economical and convenient, since the bulk material in a closed system will not be harmed at any normally used temperature. Practically there seems little reason to get it above the maximum mixing temperature. Obviously the mix temperature will be for all practical purposes determined by the temperature of the aggregate and this must therefore be given attention.

The question is sometimes raised as to whether there may not be instances

where, in order to get satisfactory drying, the aggregate temperature must be raised to such a point that the mix temperature exceeds that recommended here. This can happen, but the need for it to do so is rare. Most aggregates can be satisfactorily dried for the purposes of a hot mix—essentially a surface dry condition—without such excessive temperatures. Too intense heating, with the removal of “interior” moisture, is likely to be harmful rather than the reverse. The subject is a complicated one in the case of a few rare aggregates; but it can be generally said that through

proper drying practices—and these are not always present—the aggregate temperature can ordinarily be held at the desired level; certainly careful attention to the drying procedures is demanded before any contrary conclusion is reached. Where this is not the case, it will be necessary to give some cooling time to the aggregate, either in the handling before mixing or in the mixing chamber previous to the addition of the asphalt, so that the mix when dumped will meet the temperature requirement outlined.

The table shows the temperatures at which asphalts of 60 and 150 pene-

Case Example: How a “Standard” Temperature Specification Can Cause Trouble

That this matter of improper mixing temperature is not a theoretical problem has been shown by a number of examples. One from the writer's experience may be of interest, in that it shows the effects of the damage done may be immediately noticeable—although the loss in service life of the pavement is by far the greatest objection to hardening due to improper construction.

The job in question was a low cost type, involving a local single mix aggregate combined with a high penetration asphalt to give the desired flexibility in the mat. The specification covering the construction specified 325° maximum, but the contractor was informed by the asphalt supplier that the optimum temperature for the particular asphalt shipped was 265° F. and the maximum recommended 285. Trouble was reported from the job at the start of construction; the mix was not rolling well, and in general looked unsatisfactory. Inquiry shows that, despite the above recommendations, the actual mixing was being done at slightly under the 325° specification limit, with the idea that this would increase the rate of production from the plant.

The inspector and contractor were finally persuaded the high temperature was causing the trouble; but about this time, in order to meet the rather heavy demand for asphalt for the job, shipments were started from another source on which a 245° temperature was recommended. However, when this asphalt was used without a further temperature reduction, the difficulties reappeared, and it was again necessary to get the contractor, who had dropped

the temperature to the 285 maximum recommended for the first shipments, to go to at least the 265 maximum for the new source.

In each case, when the temperatures were reduced to the recommended range the difficulties ceased; the job very clearly demonstrated the unsatisfactory results from an arbitrary temperature limit in the specification, and the need for adjusting the actual temperature to the asphalt supplied.

Author Inspects Job

Inspection of this project by the writer after it was completed showed some very interesting results of the above history. The inspection was made during a rainy spell. The first laid (and overheated) pavement was in one lane, the properly mixed pavement later put down in the other lane. The overheated mix was rough, showed indications that raveling would shortly start, and displayed no surface layer of water, the rain percolating through the mat into the base with little difficulty. The good pavement (with exactly the same materials and quantities) was smooth, dense, and completely shed the water; the difference was striking. The overheating of the asphalt had so increased its viscosity that rolling and traffic had failed to bring about the normal compaction of the mix.

The contractor's experience showed his plant capacity had in no way decreased through the use of proper temperature, but his rolling and other operations had been harmed by the overheating. Incidentally, these overheated sections of the pavement had to be sealed within a short time in order to avoid surface failures.

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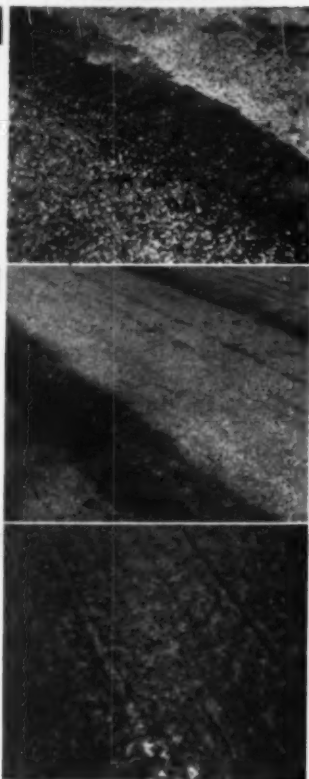
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tration from different sources will have viscosities of 75 and 150 seconds. It should be noted that as much as 55° difference in temperature is required to obtain 150 viscosity for asphalts of the same penetration but from different sources; and to obtain 150 viscosity on 60 penetration asphalts requires from 15 to 25° F. higher temperature than for 150 penetration asphalts of the same type and source. Similar temperature differences held true for the 75 viscosity. This shows that a mixing temperature suitable to obtain rapid and thorough mixing without injury to one asphalt, may be far too high for, and hence injure and harden, an asphalt from a different source. It is therefore necessary that the mixing temperature be established by the viscosity for the specified asphalt being used.

Recommended Control Method

It follows that the only logical method of controlling the mixing temperature to prevent undue hardening of the asphalt during mixing, and at the same time make the control universally applicable to asphalts of all consistencies and from all sources, is to specify that the mixing temperature be such that the viscosity of the specific asphalt being used must be held within certain specified viscosity limits during the mixing period.

On the basis of experience, it is recommended that the mixing temperatures established correspond to a Saybolt Furol viscosity of 150 seconds for the asphalt actually used. Under certain conditions that may be encountered (such as long hauls from the mixing plant to the job) where a higher temperature may be desirable for other reasons, the temperature may be raised, but not higher than that at which the asphalt will have a viscosity of 75 seconds. As previously brought out, below a viscosity of 75 seconds no appreciable benefits will be obtained with respect to ease, rapidity, and thoroughness of mixing; but the excessive temperatures required to decrease the viscosity below this point result in injury to the asphalt. The supplier should be able to give these temperatures for the asphalt shipped.

The tabulated figures are taken from individual samples and may not be representative of all asphalts from each of the sources. However, they serve the purpose of showing the possible variation in asphalts with respect to the temperature required to obtain the specified viscosities.

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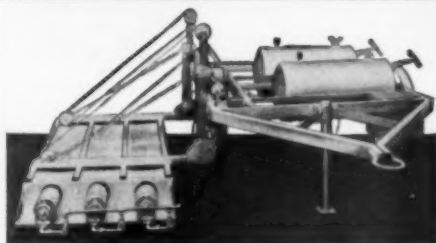
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Effect of Temperature on Viscosity of Asphalts From Different Sources and of Different Penetration

Temperatures (°F) at which the Asphalts listed will have a S.F. Viscosity of:	75 Seconds		150 Seconds	
	Penetration 100/5/77	60	150	60
Wyoming	310°F	290°F	280°F	260°F
Arkansas	325	305	295	275
Oklahoma	315	295	290	270
California	295	275	265	250
Kansas—No. 1	325	300	300	275
Kansas—No. 2	275	265	260	245

The question is often raised as to whether a hotter mix is not required in cool weather in order to permit proper rolling and laying. It can be generally said that such is not the case. In normal construction the temperature of the mix, despite some cooling in transit, is still sufficient for proper laying and mixing. The temperature differential between the mixing and rolling operations is approximately the same for all asphalts; a mix which can be combined at a lower temperature can also be rolled at a lower temperature. Of course, in cold weather operations the hot mixture should be protected in long hauls in some common-sense fashion, such as by tarpaulins. It may be desirable to mix at the top permissible temperature but any increase beyond this level is definitely undesirable as well as usually unnecessary. As a matter of fact, such an effort to improve the rolling will often defeat itself; the hotter mixing results in a higher asphalt viscosity, hence requires a higher rolling temperature so that in the end there has been no gain. Where the mix is not being delivered to a job at a temperature which is high enough for laying and rolling, the weather conditions are probably too severe to justify the operation. Certainly the cure is not to mix at an excess-



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sive temperature, but instead to sufficiently protect the mix from heat loss in transit, if it is imperative the paving work continue despite the severe weather conditions.

Consider Mixing Time

In the previous discussion it was noted that the speed of mixing below a certain viscosity is dependent upon characteristics in the asphalt and aggregate. This raises the question as to whether some attention should be given to the mixing time. It can be generally said the mixing time recommended by the equipment manu-

facturer is normally quite satisfactory. While in theory this time should be adjusted to each mix, and in the case of a high tonnage of the same mix to be handled some experimentation may be justified, ordinarily there is little need to give the matter attention. The hardening at the recommended viscosity is so small and the mixing time ordinarily used so short that the benefits from this refinement are rarely worth the effort to determine the ideal conditions for any given mix.

It is believed the bituminous construction engineer will find that the careful control of mixing tempera-

tures will insure a far higher quality of pavement than is sometimes obtained, yet with benefits instead of any real penalties in the construction operation.



★ Herman C. Helmle

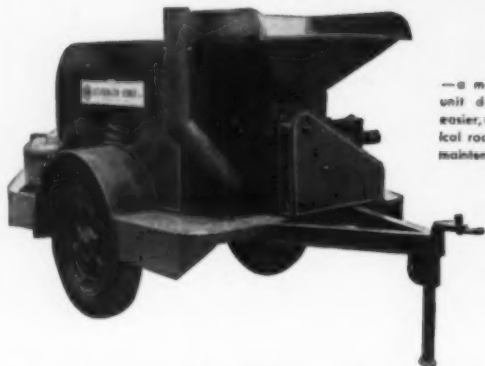
Helmle of Asphalt Institute Passes

Herman C. Helmle, District Engineer of The Asphalt Institute at Springfield, Illinois, died March 17. Mr. Helmle joined the Institute engineering staff in September, 1947, following nearly 30 year with the Illinois Division of Highways. He ably lent his wide experience in highway development to the Institute's promotion in a vital mid-western area including Arkansas, Illinois, Missouri, and Wisconsin.

Following attendance at Illinois College, Jacksonville, Illinois, where he majored in chemistry and mathematics; and then service in the First World War, Mr. Helmle became associated almost immediately with the Illinois Division of Highways as a chemist. For 9 years he was engaged principally in the testing of bituminous materials, for a time in charge of both the Physical and Chemical Laboratories of the Bureau of Materials, and later of bituminous investigational work. During this period he developed the air-bath, which is now used in the determination of solid residues from road oils, as reported in the 1923 American Society for Testing Materials Technical Papers under the names of H. F. Clemmer and H. C. Helmle.

In the 20 years prior to joining the Institute in 1947, Mr. Helmle's Highway Division work consisted chiefly of supervising inspection of bituminous construction, preparation of specifications therefor, and outlining investigational work on bituminous mixtures. This supervisory work included inspection of all bituminous plants and equipment, proportioning of ingredient materials, and their actual preparation.

The Moto-Patcher



—a mobile mixing unit designed for easier, more economical road and street maintenance.

for speedy, low-cost patching

● The Moto-Patcher delivers up to 10 tons per hour of *freshly* mixed material. The aggregate may either be shoveled into the hopper, or fed into the hopper by a small elevator (optional equipment). The mixed material is deposited on a pan of convenient height for easy shoveling, or it can be dropped directly onto the road surface. The 400 gal. tank assures an adequate supply of bitumen for uninterrupted production, making frequent stops unnecessary. The mixer, running through the bitumen tank, provides a drying action for the aggregate. If desirable, bitumen may be circulated when machine is not mixing.

Bulletin MP-51, giving specifications, flow diagram and complete information, will be sent on request.



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Bulk loads of easily-transported BITUMULS® made possible paving isolated Eniwetok at costs comparable to those of the California Highway Department. By million-gallon tankers, then from tanker to barges, from barges through submarine invasion pipe-line to shore tanks—Bitumuls was delivered to Eniwetok.

American Bitumuls & Asphalt Company specialists helped the engineering and construction firm of Holmes & Narver, Inc. develop a crushed coral and coral-sand mix with a special Mixing Grade of Bitumuls that is miscible even with ocean water. This stable, cold-mixed paving material was produced and placed in record time despite difficult tropical conditions on the atoll.

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Equipment and Materials for Engineers and Contractors

11 Entrained Air Indicator

A new entrained air indicator, an-

nounced by Central Scientific Co., incorporates several new features for determining rapidly and accurately the content of entrained air in freshly mixed concrete. The unit is now made of cast magnesium alloy instead of steel as formerly supplied. The magnesium is tough and durable to withstand the hard usage the indicator receives in field testing and the lighter weight of the improved unit makes it more convenient to carry. Quick and positive sealing of the lid is obtained with a new, unique V-band coupling which clamps around the periphery of the lid and bowl and is easily tightened by a large T-screw. The glass scale of the indicator is graduated from 0 to 8% air in 0.1% divisions and is covered by a sliding metal sleeve which protects the scale from damage



Cenco Entrained Air Indicator

A FEW HOURS CONVINCED HIM...



Less than half a day's experience with his first APSCO Base Paver satisfied an eastern contractor that this machine was all that was claimed for it . . . and more.

So he immediately ordered another!

It's that type of experience that has made the APSCO Base Paver a favorite with so many road builders. Laying up to 160 tons per hour under normal conditions, its oscillating leveling screed, depth, banking and crown controls produce accurate, economical results.



Although currently unable to make immediate delivery, we shall be glad to discuss your requirements with you and tell you more about the savings and other advantages of APSCO equipment. Please write.

ALL PURPOSE SPREADER CO. Elyria, Ohio U.S.A.

during transit. The indicator permits rapid control of concrete mixture by pressure measurements as prescribed in the American Society for Testing Materials Method C-231. Central Scientific Co., 1700 Irving Park Road, Chicago 13, Ill.

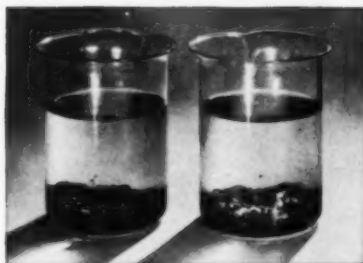
12 Automatic Transmission Oil Pumps

Three models of automatic transmission oil pumps, each designed with the Alemite-engineered filter in the nozzle at the point of delivery, have been announced by the Alemite Division of Stewart-Warner Corporation. Besides the filter, Model 7076, which matches other units in the Alemite "Visidrum" line, features volume delivery through a meter which registers in quarts. The 7-ft. hose with 6-in. knurled handle, is equipped with a flexible extension nozzle which fits all cars, eliminating adapters. Protection against drippage is guaranteed by the positive manual shut-off, another feature of these



Model 7076 Automatic Transmission Oil Pump

GUARD AGAINST ROADS that end up in the gutter!



◆ These un-retouched photos show why DARAKOTE is making friends everywhere. Left photo contains aggregate coated with DARAKOTE-treated asphalt and immersed in water. Note how asphalt stays bonded to aggregate! Right photo shows aggregate coated with untreated asphalt and immersed in water. Note almost complete stripping of the asphalt from the aggregate!

■ ■ ■ ■ ■ Many an asphalt road never had a chance! Water — from sudden rains, high humidity, or simply from moisture present in the aggregate — has prevented a close bond between the aggregate and the asphalt mix. The result: asphalt that strips off onto tires, aggregate that's whipped off into the gutter, roads that don't stand up!

More and more highway departments now specify DARAKOTE Anti-Stripping Additive to "guard against roads that end up in the gutter". DARAKOTE, added to the asphalt mix, actually displaces water; it prevents stripping both during and after construction, extends service life and durability of the pavement.

At the same time DARAKOTE saves money! It enables road crews to work despite bad weather, giving you more working days in each paving season. And it permits wider use of local aggregates.

Be sure DARAKOTE is included in your plans for 1952 road construction and maintenance. Write for colorful, factual brochure today!

CONSTRUCTION SPECIALTIES DIVISION



**DEWEY and ALMY
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105

BITUMINOUS ROADS AND STREETS

models. An air eliminator assures accurate delivery regardless of the level of the fluid in the container. This model is equipped with a white enamel cover for the drum. The container is moved into position for use on a rugged dolly fitted with four large Bassick casters. Model 8121, which harmonizes with other shielded equipment in the Alemito "Marshal" line, is equipped with all of the features of Model 7076 plus push-pull handles on the sides of the shield. Model 7039 is especially designed for use with bung-type drums. The pump fits into the 2 in. p.t. bung of a 15 gal. drum and has all of the features of the other two models with the exception of the cover for the drum. Stewart-Warner Corporation, 1826 Diversey Parkway, Chicago 14, Ill.

13

Stockpile-Windrow Loader

A new stockfish-windrow loader, announced by Athey Products Corporation, has as one of its outstanding features the Athey full floating feeder. The feeder is suspended from two coil springs and a pivot allowing the paddle blades to "float" over the contours of the windrow. The loader has a new auger gather-feeder that speeds up loading from stockpiles and wide windrows. The spiral blades extend to the moldboards of the gather and keep a steady flow of materials feeding inward to the paddle blades. The 30 in. conveyor belt of the new loader is cleated to handle snow, sand and other light materials as well as heavier earth,



Athey Force-Feed HiLoader

dirt, rock and the like. A swiveling discharge conveyor is another feature of the loader. The conveyor can be directed 45° right or left of center and is controlled hydraulically from the operator's seat. The operator's platform is on the left side for unobstructed visibility in all directions. All operations are controlled with hydraulic power, with levers in easy reach of the operator's seat. A Ford, 95 h.p., 6-cylinder engine powers the unit which can travel at speeds up to 19 m.p.h. Loading speeds range through four gears from 0.3 to 1.92 m.p.h. The entire unit is 34 ft. 7 in. long and only 23 ft. are required for a non-stop turn. Athey Products Corporation, 5631 West 65th St., Chicago 38, Ill.

14

4,000 Gal. Distributor

One of the largest bituminous distributors ever built by Rosco Manufacturing Co. of Minneapolis is this specially designed 4,000 gal. unit to meet the specific requirements of Myrl Clark, contractor of



4,000 Gal. Bituminous Distributor

Tyndall, S. Dak. This fully enclosed, streamlined distributor, having the latest and most modern bituminous application features, is of "frameless" semi-trailer, tandem-axle construction. Designated Model RQE-TT, this complete unit is equipped with an 18 ft. full-circulating Rosco spraybar.

15

Cam Valve

A small companion model to its line of cam operated valves has been announced by Ross Operating Valve Co. Excluding the cam roller, the new unit is less than 4 in. high and has a 3 in. by 3½ in. base. It is a ¼ in., four-way valve with a long lever. The lever travel is less than 1 in. Known as Ross Valve Number 636, the new model is a small, rugged version of



Ross Small Cam Valve

NO TIME LOST! LOADING OR LAYING ITS LOAD



A STANDARD STEEL
PRESSURE DISTRIBUTOR
GIVES EQUAL CIRCULATION THROUGHOUT
THE SPRAY BAR FOR A
UNIFORM SURFACE
FROM CURB TO CURB
FOR LONGER WEAR

STANDARD STEEL PRESSURE DISTRIBUTOR

The Model 424 can be loaded in quick time for a "fast get-away". A two-way cleaning system guarantees a clean spray bar at the end of the day. First, the material is sucked out of the bar and back into the tank. Then by turning one small valve, cleaning solvent is released into pump and spray bar (without contaminating the asphalt in the tank). No time lost in tinkering—no time lost in loading—Standard Steel 424 keeps going all day long far ahead of the "gravel gang".

WRITE FOR CATALOG 434

OTHER PRODUCTS OF STANDARD STEEL

Maintenance Distributors, Tar Kettles, Patch Rollers, Supply Tanks, Tack Heaters, Asphalt Tools, Street Flushers, Construction Brooms.



Standard Steel Works NORTH KANSAS CITY, MO.



NO ROAD TOO ROUGH NO TARRING JOB TOO TOUGH

**FLEXIBLE PENFLEX FLOWS TAR FREELY
... STANDS SEVERE ABRASION AND HEAT**
Tough and tight as rigid pipe . . . flexible as hose. Leak-proof, heat-proof, wear-proof—rugged Penflex flexible metal tubing withstands roughest road surfacing conditions . . . assures safe, trouble-free, smooth-flowing transmission of hot tar.

On paving mixers, road spraying trucks, tank car unloaders, tar and asphalt heaters, hand patching units—wherever the going is tough—flexible Penflex tubing has been

proved and approved through years of dependable performance.

Leading manufacturers and users of road surfacing equipment specify Penflex, because its sturdy 4-wall interlocked construction resists kinking and crushing . . . defies constant flexing, abrasion and heat.

Penflex engineering service (flexineering) is at your service. For complete details on application of Penflex flexible tubing and heat-proof couplings to all types of tar and asphalt equipment, write for Bulletin 91 today.

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as used on the New Jersey
Turnpike*

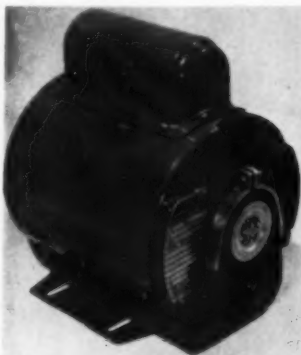


Write for
Descriptive Literature

the Ross cam operated valve line. It is claimed to be especially suitable for low volume applications requiring a mechanically operated valve. Ross Operating Valve Co., 120 East Golden Gate, Detroit 3, Mich.

16 Fractional Horsepower Motors

A new line of fractional horsepower motors embodying an entirely new concept of motor design and manufacture has been announced by the General Electric Co.'s Fractional Horsepower Motor Department. Designated as "Form G," the new motors are the result of nearly a decade of developmental engineering and research, and incorporate many rad-



1/2 HP Form G Motor

ically different and advanced design features. According to G-E engineers who worked on the project, the Form G motor weighs as much as 51 per cent less per horsepower than the models it replaces and is considerably smaller in size. At the same time, its versatility of application has been broadened and its appearance modernized. The motors are available in open dripproof and totally enclosed fan-cooled models in Types K (polyphase), KC (capacitor start), KH (split phase), and KCP (permanent split capacitor). The motors will be offered in a complete range of standard horsepower, speeds, voltages and frequencies. General Electric Co., Schenectady 5, N. Y.

17 Blade for Tractor

A new multi-purpose blade has been introduced by Harry Ferguson, Inc. No tools are necessary to make the five minute attachment to a Ferguson or



Blade With Attachments

Ferguson System tractor. Two stabilizer bars are used to eliminate side sway of the implement. The 6-ft. blade, with a moldboard height of 14 in., can be rotated a full 360°, permitting either

LITTLEFORD ROAD BROOMS

GIVE ADJUSTABLE
BROOM TENSION...

SAVING WEAR ON THE BRUSH... GIVE ECONOMY IN HIGHWAY SWEEPING

When you're putting your money on the line for new Road Equipment, naturally you want the most efficient and economical units available. Where can you get more for your dollar when investing it in a Littleford Road Broom? Here is the only Road Broom with Patented Hydraulic raising and lowering system; this arrangement saves dollar upon dollar in brush replacement. The tension on the brush can easily be adjusted to the road surface which reduces brush wear. This is only one of the many features found on either the Engine Driven or Traction Driven Broom. Remember the LB sign means Littleford Bros. and Lower Budgets for the best in road equipment.



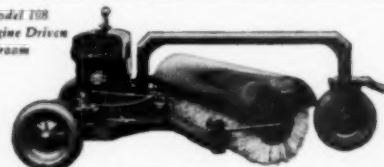
LITTLEFORD

LITTLEFORD BROS., INC.
454 E. Pearl St., Cincinnati 2, Ohio



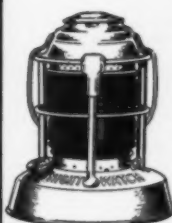
Model 106 Traction Driven Broom

Model 108
Engine Driven
Broom



There is No DETOUR from SAFETY when is on the Job

DIETZ NIGHT WATCH LANTERN



Burns 100 hours

Releases Straight-line Pencil Beam of great intensity, visible from all angles, nearby and at really great distances. Exclusive fresnel globe and trip-lock release of chimney.

First in safety—for safety first.

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The world's most reliable, portable light. Burn bright or dim for long hours, to the last drop of Kerosene, regardless of weather conditions. Economical. Available upon request with stamped-in "name" to prove your ownership.



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Made better, to serve better. Non-tip base. Leak proof, and weather proof. Burn for 30 hours. Popularly priced and very economical, too.

R. E. DIETZ COMPANY
EST. SYRACUSE 1, N. Y. 1840
OUTPUT DISTRIBUTED THROUGH THE IRONING TRADE EXCLUSIVELY

pulling or pushing action. Also, it can be angled either to the right or left 15°, 30°, 45° and 60°—whether in the forward or reverse position. A scarifier, side plate, blade extension and grader wheel are some of the attachments which increase the usefulness of the blade. Ferguson System finger tip hydraulic control adjusts depth of cut, or raises the blade into transport position. Harry Ferguson, Inc., 3639 E. Milwaukee Ave., Detroit 11, Mich.

18

Electric Hand Lamp

A new portable electric hand lamp announced by U-C Light Manufacturing Co., features a hermetically sealed beam bulb that seals out dirt and moisture from the mirrored surface of the reflector and gives



Model 166 Big Beam Hand Lamp

brilliant prefocused light—anywhere, any time. It is powered by one standard 6-volt lantern battery and its lamp-to-battery pressure-type contacts permit battery replacement in seconds. Its 4-in. lamphead and comfort-built handle are chrome finished. U-C Light Manufacturing Co., 1050 West Hubbard St., Chicago 22, Ill.

19

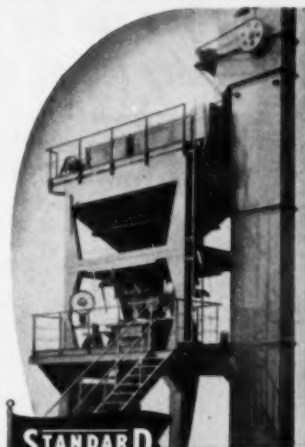
Saw Filing Jig

A saw filing jig for sharpening hand-saws has been placed on the market by A. D. McBurney. The jig is held on the saw by set screws and features two hardened steel depth-control rollers which roll



Combination Saw Filing and Jointing Rig

with the file; stop it at the precise depth; and keep all the teeth exactly the same height during the filing. Overfiling is prevented. The jig is equipped with depth adjuster and bevel guide. The bevel guide permits the saw to be filed at the correct bevel. The jig can also be used as a jointer by using a 6 in. mill file. A. D. McBurney, 317 E. 4th St., Los Angeles 13, Calif.



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The most rugged plants in America and the cheapest to own and operate. Less maintenance. Simplest design. Seven sizes. Unit built. Prompt delivery.

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Is saving time and money for contractors and highway departments the country over. From large to small, they are all proving the economical operation of our spreaders.

Typical owners include—

- STATE HIGHWAY DEPARTMENTS
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- STREET DEPARTMENTS
LARGE CITIES—(as Philadelphia)
SMALL CITIES—(as Huntington, Ind.)
- COUNTY HIGHWAY DEPARTMENTS
- LARGE CONTRACTORS
Operating up to 4 hot mix plants.
- SMALL CONTRACTORS
Doing driveway work

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I. J. OVERMAN MFG. CO.
BOX 201 MARION, IND.

**Now you can lay up to 12" thickness
11' wide; lesser thicknesses to 12½'**

**JAEGER Paver-Type
AGGREGATE SPREADERS**
for both base and surface aggregates,
free-flowing hot or cold bituminous mix-
tures, plant-mixed stabilized soil.

Cost ½ the price
of bituminous pavers and are better
adapted to lay base materials. Also
lay top on macadam and bituminous
secondary roads, parking areas, drives.

All traction on subgrade
No displacement of loose material.
Crawlers or 4-wheel drive, to suit.



In one pass you can now lay as much as 10" of coarse stone, or as much as 12" of finer or graded materials, in 10' to 11' widths, or the same volume of material in greater widths to 12½" with slightly less thickness. Or lay up to 25' with two of these low-cost spreaders in tandem. Place material as fast as trucks can deliver, to accurate thickness maintained by straightedge runners; blend perfect joints. Proved on hundreds of jobs, from Pennsylvania and New Jersey Turnpikes to city parking lots. Two models, to work with any size trucks.

See your Jaeger distributor now — or send for Catalog SP5-1

THE JAEGER MACHINE COMPANY

223 Dublin Ave., Columbus 16, Ohio

BITUMINOUS PAVERS • CONCRETE SPREADERS, FINISHERS • COMPRESSORS • PUMPS

20

Snow Blower

A snow blower attachment for motor graders is illustrated below. The Domor blower is a propeller-type impeller that works with a snow wing on a "Caterpillar" No. 12 or 112 Motor Grader. The



Snow Blower on a No. 12 Motor Grader

48 in. fan is driven by a power take-off, at a 500 rpm rate. The drive is the same as that used with the Domor elevating grader and can be used interchangeably. The blower is easily attached and is controlled from the grader cab. Snow and ice are bladed onto the wing and into the propeller. The high-speed, positive powered rotary blades cast the snow off the shoulder and away from the right-of-way. The Domor Snow blower is sold and serviced by "Caterpillar" Dealers.

George Washington Traveled This Road

The two pictures reproduced on the Bituminous cover page vividly illustrate the progress made during the past three decades in the development of principal highways in the United States.

Both pictures were taken on US 1, below Alexandria, Va. This is the main highway from Washington, D.C., to Richmond and points south. The building shown in the background is historic Pohick Church, where George Washington and members of the Mount Vernon household worshipped 175 years ago.

The Washington-Richmond highway in 1913 was not much better for travel than it was in the days when Washington rode horseback from Mount Vernon to attend divine services at Pohick Church. Although automobiles had been in use for twenty years, long sections of main highways throughout the country were still "dirt" roads. Urban dwellers, as well as the farmer, were frequently stuck in the mud when they ventured beyond the city limits.

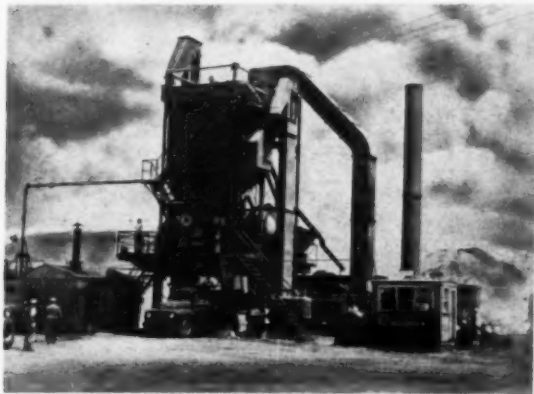
Today—within the span of one generation—US 1 from Washington to Richmond is a four-lane road carrying large volumes of traffic into and out of Washington. An average of nearly 10,000 motor vehicles traverse this section of US 1 every day throughout the year.

George Washington would recognize Pohick Church, which has changed little in outward appearance since his time, but he wouldn't know the road.

YES, Simplicity has the biggest capacity, *BUT*



The SIMPLICITY Model S-100, 10' x 20' Simplicity double-shell dryer; 5' x 14' double-deck vibrating screen, 5000-lb. weighing and mixing systems. Diesel powered. Rated capacity, 100 tons per hour.



The SIMPLICITY Model S-80, 8' x 12' Simplicity double-shell dryer; 4' x 12' double-deck vibrating screen, 5000-lb. weighing and mixing systems. Diesel powered. Rated capacity, 75 tons per hour.



THE TWO PLANTS ABOVE WERE PHOTOGRAPHED IN OPERATION ON THE NEW JERSEY TURNPIKE.

PICTURE BOOK ON REQUEST

We have a book "Simplicity in Pictures." It tells the facts about Simplicity Plants, where they are and who owns them. A copy will be sent you free on request.

Simplicity has so much more **DEPENDABLE** CAPACITY than any other asphalt plant that it is almost automatic to think of Simplicity in terms of **BIG CAPACITY**.

Capacity is important. On a lot of jobs it is the difference between losing your shirt and making a fair profit. But in many instances there are other things about Simplicity plants that are equally important . . . or more important. For instance:

SIMPLICITY IS DEPENDABLE

"DEPENDABLE" has been Simplicity's slogan since its beginning. No other asphalt plant approaches Simplicity's record for **DEPENDABLE** operation.

SIMPLICITY IS DURABLE

Every Simplicity asphalt plant that has ever been built is still in successful operation.

SIMPLICITY IS ECONOMICAL

Simplicity plants produce better asphalt and more asphalt at less cost than any other plant.

SIMPLICITY SERVICE IS ALWAYS AVAILABLE

Service on plants in service comes first with Simplicity. We make nothing but asphalt plants and our men really know asphalt plants.

THE SIMPLICITY SYSTEM COMPANY

CHATTANOOGA, TENNESSEE

DEPENDABLE

• **AUXILIARY SIMPLICITY UNITS** such as feeders, dryers and mixers often improve and increase capacity of any make of asphalt plant. Currently available Simplicity asphalt storage and heating systems are important insurance for economically maintaining big plant capacity. Details on request.

P&H**SINGLE PASS PROCESSING METHOD**

A P&H Model EA-56 Stabilizer processing soil-cement streets in a new residential section of Fond du Lac, Wisconsin.

Now...these Proved Advantages on Smaller Jobs of SOIL STABILIZATION!

Yes, small road builders, public and private alike, can now profit from the most practical method of soil stabilization ever developed.

This new, smaller P&H Stabilizer — the Model EA-56 — processes in 5-foot strips — making it ideal for street, highway, alley, airport and other kinds of jobs. It performs with all the economy and quality control of the larger P&H Stabilizers — processing native soils or aggregates with any type of admixture into a fine, lasting base of uniform and predetermined strength. The P&H machine is for granular, bituminous and cement soil stabilization work.

The P&H Single Pass Processing Method cuts costs

by its high rate of production and the minimum of labor, allied equipment and supervision required. Jobs are completed as much as 30 per cent faster because of minimum lost time due to adverse weather. The machine performs *all* of the basic requirements, except compaction, for successful soil stabilization in *one* pass with just *one* operator.

Get the full story on the P&H Single Pass Stabilizers, proved on jobs everywhere. Three sizes for a variety of job requirements: 5, 8 and 10-foot processing widths.

P&H SINGLE PASS SOIL STABILIZERS
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SEE THESE SOUND-COLOR FILMS!

Lent Free: Films are available which cover the P&H Processing Method of soil cement and soil bituminous construction. Ask about them, today.

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4/52 RAS

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Equipment and Material Notes

21

3.6 HP Engine

A new and compact engine (Model K90) announced by Kohler Co., is a rugged power plant with a 3.6 H.P. rating at 3600 r.p.m. It weighs 44 lb. Among the features of the K90 are anti-friction ball bearings at both ends of the crankshaft, easily accessible breaker points which are dustproof and moistureproof



Model K90 Engine

and externally mounted for speedy servicing. The ignition system operates from a high voltage crankshaft magneto which insures instant starting. All K90 models have a precision oil-bathed fly-ball governor, glass sediment bowl with fuel shut-off valve, rotating screen, muffler, and oil-bath air cleaner. Variations of the basic K90 engine design are available in the K90P which is built for direct mounting with a threaded crankshaft and K90R engine which is equipped with a 6 to 1 reduction gear. Kohler Co., Kohler, Wis.

22

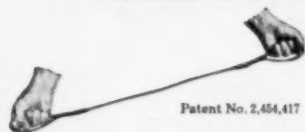
Rubber Tired Trencher

A new, highly mobile, rubber tired, ladder type Trenchliner, designed to handle all types of utility excavations, has been announced by the Parsons Co., a subsidiary of the Koehring Co., Milwaukee, Wis. This Model 88 Trenchmobile digs to a maximum depth of 5 ft. and widths of 8 or 10 in. Powered by a 43.6 H.P. gasoline engine, the Trenchmobile is heavy-duty unit constructed on an all-welded arch type frame. Variable speed selections are provided for operating the bucket line, conveyor belt, travel and digging trac-



Model 88 Trenchmobile

MAKE THIS TEST YOURSELF...WITH A FREE Tuffy SLING



Tie a knot in a Tuffy Sling, then pull it tight with both hands and feet. See how flexible it is — and how it straightens out without damage. The secret is in the braided fabric construction — a patented Tuffy feature!

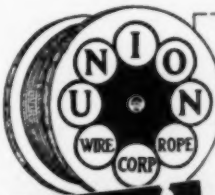
Scores of wires are stranded into 9 parts, then machine woven into an interlaced wire fabric entirely unlike conventional wire rope slings. Even cutting one of the 9 parts does not result in stranding. And eye splices develop up to 95% of the fabric strength.



11 Types of Tuffy Slings If none of the 11 factory packaged Tuffy Sling types exactly meet your needs, Union Wire Rope engineers will develop one that does. Tuffy Slings are proof-tested to twice safe working load. The safe working load is stamped on a metal band attached to each sling. If you have your own rigging left, Tuffy braided fabric is available by the reel.

MAIL COUPON TODAY FOR YOUR FREE SLING

This special 3-foot sample is yours without cost so that you can prove to yourself the advantages of a Tuffy Sling. Just mail the coupon.



UNION WIRE ROPE CORPORATION
Specialists in Wire Rope, Braided Wire Fabric and High Carbon Wire
2200 Manchester Ave.
Kansas City, Mo.

Gentlemen: Please have my Union Wire Rope Fieldman deliver my free Tuffy sling sample.

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QUALITY LINE
depend on
CARVER
PUMPS**



Model KN1½L
4000 G.P.H.

A COMPLETE LINE

Carver Self-Priming Pumps available in all sizes from 4,000 to 240,000 G.P.H. Gas, Diesel, Motor or Belt Drive. Also Diaphragm Pumps up to 6,000 G.P.H. Ask for Bulletin No. 110. Carver Pump Co., 1056 Hershey Ave., Muscatine, Iowa.



**REPLACEABLE LINERS
AND IMPELLERS**

Sturdy, wear-resistant replaceable liners and impellers are standard equipment in all Carver Contractor Pumps. When wear eventually occurs you don't replace the entire costly casing, as in ordinary pumps. Simply remove and install a new liner, a new impeller if necessary, and new pump efficiency is restored at nominal cost.

Another Carver Quality Feature!

A QUALITY LINE

Quality is our strong forte—Every Carver Contractor Pump is designed and manufactured with one specific purpose in mind—to provide you with rugged dependable equipment, loaded with reserve power and stamina, to handle the toughest construction jobs. Nothing fragile about these pumps; no skimping on materials; no underpowering; no compromise of quality. Throughout their many years Carver pumps have earned an enviable reputation in the field for dependable, efficient and long-life service. We shall continue to build pumps that will perpetuate this reputation.

**Specify Carver Contractor Pumps—
your best buy for better performance.**

**CARVER
PUMPS**

tion. The 88 has road speeds up to 12.65 mph for self powered moves between jobs. Pneumatic tire mounting plus low ground pressure permits working and traveling over sidewalks, driveways and lawns without surface damage. In addition, these outstanding Parsons features are incorporated in the new Model 88: controlled discharge through a reversible and shiftable belt conveyor; telescopic ladder type boom with positive down crowd; a hinged crumpler that permits vertical set-ins and undercutting; self cleaning buckets fitted with easily replaced Parsons "Tap-I" teeth; automotive steering and rear wheel hydraulic brakes; antifriction bearing mounted main shaft with fully enclosed gears running in oil; optional blade for backfilling. The Parsons Co., Newton, Ia.

23

15-Ton Ripper

A 15-ton, heavy duty ripper, stated to be capable of penetrating 60 in. in extremely tough material, is now being made by Peterson Tractor & Equipment Co. It is stated the ripper will take the combined drawbar pull of six of the largest tractors now on the market or 180,000 lb. on the center tooth alone.



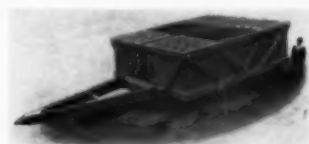
15-Ton Heavy Duty Ripper

The makers claim it will rip any laminated or foliated material, such as shale, decomposed granite, etc. The center is designed for three depths of penetration—60 in., 48 in., and 36 in.; the outside teeth for two depths—48 in. and 36 in. It is stated that the ripper has a wide range of application and in many cases will take the place of explosives for shattering material to be handled by scrapers or shovels. The first of the rippers was sent to Isabella Dam for pre-watering and other heavy-duty work. Peterson Tractor & Equipment Co., San Leandro, Calif.

24

200-Ton Compactor

A new 200-ton rubber tired roller, announced by Shovel Supply Co. was designed for use in testing fills on air base runways, particularly where XB52 jet bombers and other heavy planes are to operate; and also for other fills where extreme compaction is necessary. The roller is designed in two halves, each half being provided with two tires and so arranged that each half will oscillate



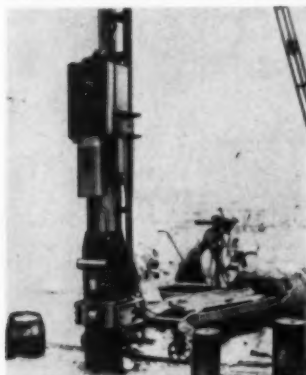
200-Ton Rubber Tired Roller

independently, thus following the undulation of the fill exactly. The unit is equipped with 4 3000x33 in. 60 ply 150 lb. p.s.i. Goodyear tires, each tire designed to carry a load of 100,000 lb. Specially built wheels are equipped with Timken bearings and grease seals. A special feature is the arrangement whereby wheel assemblies may, when necessary, be removed through the top of roller frame, thus facilitating tire repairs, etc. The roller, empty, weighs 77,000 lb. Cast iron ballast blocks weighing 2500 lb. each, equipped with lifting loops, and made to fit ballast compartments closely, give a ballast weight of 323,000 lb. and a total weight of 400,000 lb. Shovel Supply Co., P.O. Box 1369, Dallas, Tex.

25

Diesel Pile Hammer

A new model, the No. 3000 DPH, has been added to the line of self-contained diesel pile hammers of Syntron Co. Operating on the diesel principle, the hammer is completely self-contained, so does not require auxiliary power such as steam



Diesel Pile Hammer Driving Wood Piles

boilers or air compressors. The force of each blow is remotely controlled by the operator—from non-impact idling to full power—through a hydraulic system. The hammer can be easily handled by a gasoline or diesel engine-driven crane or furnished complete with rig, leads and hoisting engine. The No. 3000 DPH operates at 110 blows per minute and its 1200 lb. ram delivers 3000 foot lbs. per stroke. It is 9 feet long by 18 in. wide, fits in 18½ in. leads and weighs 3000 lb. Syntron Co., 384 Lexington Ave., Homer City, Pa.

26

Clay-Digger

A new light-weight Thor pneumatic clay-digger, announced by Independent Pneumatic Tool Co. features interchangeable parts to meet every clay digging requirement. The new No. 16



Thor No. 16 Digger



RUBBER-TIPPED
VIBRATORS

EXTERNAL VIBRATORS

AIR CLAMPS



VIBER
*Leadership starts on
the drawing board...*

where new products are constantly being developed to furnish you a complete line of superior vibration equipment.

*and is proved in
the field...* where greater performance, more years of efficient work at low cost operation have made Vibber standard equipment with leading contractors throughout the world.

Please write for Vibber's new illustrated catalog on its standardized line and new products.



VIBER COMPANY
Concrete Vibrators Since 1931

Dept. 61, 726 South Flower Street • Burbank, California



Operator Ernest Duff likes MICHIGAN'S air controls and the accessibility of engine and clutches.

it's MICHIGAN exclusively for James Armour Excavating Co.

Owner of eight MICHIGAN Excavator-Cranes, this Philadelphia contractor is for MICHIGAN'S 100%. Why? His first MICHIGAN convinced him that they have what it takes.

In a housing project, a MICHIGAN Truck Hoe removed and re-laid 1,000 feet of 6-inch water line at a lower depth to accommodate a new street grade. The MICHIGAN trenched down to hard rock. The rock was then blasted and the MICHIGAN completed the trench and re-laid the water line, finishing the entire job well within schedule. Says owner Jim Armour: "We can handle these jobs at lowest cost with a MICHIGAN."

Whether or not your work is in rock . . . next time you need an excavator-crane . . . investigate MICHIGAN $\frac{3}{4}$ -yd. and $\frac{1}{2}$ -yd. excavator-cranes . . . your best buy!

MICHIGAN POWER SHOVEL COMPANY

480 Second Street, Benton Harbor, Michigan, U.S.A.

Digger offers optional inside or outside trigger, closed retainer or latch retainer, choice of five chucks for square, hexagon, or combination hexagon and round shank steel. The unit weighs 20 lb., is 19½ in. long and is equipped standard with chuck to take steels with ¾ in. square x 2½ in. long shanks. Optional chucks take ¾ in. hexagon x 2½ in. shanks; ¾ in. hexagon by either 2½ in. or 3¼ in. long shanks; and combination .882 hexagon and 1.027 round x 3¼ in. long shanks. Accessories available in these shank styles include clay spades or scoops, flat picks, sow tooth chisels, moil points, narrow chisels and chisel blanks. Independent Pneumatic Tool Co., 175 North State St., Aurora, Ill.

27

Crawler Crane

A completely new ¾ yd. crawler crane, available with a choice of fronts, crane, shovel, dragline or pull shovel, has been announced by American Hoist & Derrick Co. This Model 375 BC, follows the same basic "American design" used in their 80 ton capacity locomotive crane and 100 ton revolving crane in that the machinery platform is an inte-



Model 375 BC Crawler Crane

gral rolled steel electrically welded unit. It definitely falls in the heavy duty 45,000 lb. class. Track pads are double walled, special steel castings with full length pins. The steel used is a special development that reduces abrasive wear to a minimum, yet withstands the shock and strain of rough travel without breakage. This track pad was developed for use on previous crawler machines and to the Company's knowledge there has been no record of a broken pad in the last 5 years. Mantex or Corten, a special light weight alloy steel, is used in the boom, eliminating dead weight and permitting maximum pay loads. Of special significance is a high speed boom hoist with controlled lowering arrangement which is standard equipment. Boom radius may be changed with perfect control and without danger of dropping the boom. Actually the boom lowers against the compression of the engine and can be lowered at any speed desired by the operator. The maximum lowering speed is the same as maximum raising speed, American Hoist & Derrick Co., St. Paul, Minn.

28

Steel Shore

A self-contained, telescoping steel shore that is handled by one man and permits micro-adjustment has been announced by Safway Steel Products, Inc. The new products can be used effectively in supporting formed for concrete slabs,

beams, column, walls, tunnels and other shoring work. The shores permit a 5 ft. range of adjustment. Only three sizes cover a range all the way from 6 ft. to 15½ ft. above the mounting surface. The three sizes of shores have height ranges for 6-11 ft., 8-13 ft. and 10½-15½ ft., respectively. Heavier load-carrying capacities to as high as 9,900 lbs., with adequate safety factor, are made possible by the special sleeve nut design.

29

Rubber Product for Road Construction

An entirely new synthetic rubber product for use in road construction, announced by The Goodyear Tire & Rubber Co., is a finely-divided free-flowing powder made by co-precipitation of a butadiene-styrene latex and a mineral filler. The new material as a free-flowing powder is stated to be easy to handle and to mix freely with the asphalt. The material has been developed in cooperation with the Berry Asphalt Co., Magnolia, Ark. The rubber can be made available in two forms: as the co-precipitate with some of the fine mineral aggregate normally used in bituminous concrete, or as a pre-mix with powdered asphalt. In either state, the rubber is equally effective. Several tons of the material have already been produced in Goodyear's pilot plant at Akron and a number of test installations placed in the Middle West are being watched carefully by research experts of Berry Asphalt and Goodyear, as well as highway construction engineers. Other test installations are planned this year. The Goodyear Tire & Rubber Co., Akron, O.

30

Conversion Power Package

A conversion power package for motor cranes carriers, developed by The White Motor Co., is claimed to offer greater horsepower and higher operating efficiency. The engine used in the power unit is an industrial application of the White Model 280A Mustang engine. The White Mustang gasoline engine is a 6-cylinder, 204 cu. in. unit with 4½ in. bore by 5 in. stroke rated 184 HP at 3000 r.p.m. with accessories to permit ready conversion. The White Motor Co., Cleveland 1, O.

RUEMELIN BLAST GENERATORS

FOR CLEANING BRIDGES— WATER TOWERS—STRUCTURAL STEEL



Many contractors use Ruemelin Blast Generators for cleaning steel work to remove rust, paint and scale before repainting. These machines are also used to remove laitance from cement wherever concrete construction is in progress. A wet adapting nozzle can be furnished to convert dry machines to wet type of operation. Built in several sizes.

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Bulletin 36-C

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**RUEMELIN
MFG. CO.**

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Manufacturers
and Engineers
SAND BLAST AND
DUST COLLECTING
EQUIPMENT,
WELDING FUME
COLLECTORS.

**NEW SAFETY
Traffic Cones**
now only **\$1.95** each *

Patent No. 2333273

CAUTION Beware of buying products that violate existing patents. Safety Traffic Cones are manufactured and sold under Patent No. 2333273, covering Traffic Cones, which offers absolute protection to the buyer against any lawsuit due to infringement. Be sure any traffic cones you buy bears Patent No. 2333273.

LOOKS LIKE STEEL... MADE OF RUBBER

The Safety Traffic Cones steel-like appearance commands respect of motorists and pedestrians, yet is made of safe collapsible rubber. It efficiently marks proper lanes of traffic and guides motorists away from hazardous conditions.

COLORFUL LONG RANGE VISABILITY for DAY TIME USE. REFLECTORIZED BRILLIANCE for POSITIVE NIGHT CONTROL

The brilliant red, yellow and black color combination offers high visibility to the motorist and provides ample warning that there is danger ahead. The reflectORIZED Safety Traffic Cone provides the same positive traffic control after dark.

NEW LOW PRICE PRODUCES ECONOMICAL AND EFFICIENT TRAFFIC CONTROL SYSTEM

LOOK AT THESE FEATURES

- long life
- formulated paint reduces maintenance expense
- eliminates man hours formerly consumed building wire, wood and old fashioned barriers
- will nest with any traffic cone marker made to date under Patent No. 2333273

*\$1.95 each in quantities of 500 or more; \$2.30 each in quantities under 500. Freight prepaid on all shipments over 100 lbs. ReflectORIZING of cones 50¢ each.

We invite distributor inquiries.

For further information write:

SAFETY TRAFFIC CONE CORP.
949 North Vignes • Los Angeles 12, California

WITH THE MANUFACTURERS & DISTRIBUTORS

Cartwright Appointed General Sales Manager. A. C. (Andy) Cartwright, formerly Central Eastern Division Sales Manager for the Trackson Co., has been appointed general sales manager for Seamen Motors, Inc., Milwaukee, Wis.

Euclid Appointment. The Euclid Road Machinery Co., Cleveland, O., has estab-

lished a new sales and service branch at 339 West Maple St. in Monrovia, Calif. A. E. Sorensen, formerly manager of the company's branch at Emeryville, Calif., is manager of the new branch. P. A. McDonald succeeds Sorensen as manager of the Euclid branch at Emeryville. He has been transferred from Minneapolis where he was Euclid District Manager since 1949. W. P. Sutherland has been appointed district manager for the territory previously covered by McDonald.

Davis Appointed District Sale Representative. Leslie R. (Les) Davis has been appointed district sales representative for W. A. Riddell Corporation, Bucyrus, O. He will work closely with Warco distributors in the states of Wisconsin, Iowa, Minnesota, Nebraska, North Dakota and South Dakota.

New Hough Representative. Gene Thomas has been appointed district representative of The Frank G. Hough Co., Libertyville, Ill., for sales district six which covers the states of Washington, Oregon, Idaho, Montana and Wyoming.

Gar Wood Industries Appointment. Arthur F. Dries has been appointed manager sales promotion and advertising for Gar Wood Industries, Inc. He will be in charge of the central advertising department which handles all sales promotions and advertising functions for Gar Wood's Findlay, Wayne, St. Paul, Richmond and National Lift Divisions as well as the Gar Wood branch offices in major cities throughout the country.

Named Factory Manager. William G. Tannert has been appointed factory manager of Trackson Co., Milwaukee, Wis., a wholly owned subsidiary of Caterpillar Tractor Co., Peoria, Ill. Mr. Tannert was previously general planning superintendent at Caterpillar.

Larkin Elected Director. David Larkin, former executive vice president has been elected to the board of directors of Broderick & Bascom Rope Co., St. Louis, Mo. A. A. Grosse, assistant treasurer has been elected to the position of secretary, a position formerly held by Joseph H. Bascom, now executive vice president and treasurer.

Clarke New District Manager. L. J. (Jack) Clarke, formerly New Orleans manager for A. Leschen & Sons Rope Co., St. Louis, Mo., covering the Gulf States of Louisiana, East Texas and lower Mississippi, has been transferred to their New York office as district manager.

Promotions by Universal Atlas. Mac H. Hull, assistant to vice president, and James C. McClure, sales manager of Dayton, O., territory, have been appointed assistant vice presidents of Universal Atlas Cement Co., New York. David H. Deacon, assistant sales manager at Dayton, has been named sales manager, succeeding Mr. McClure.

Carson Appointed General Manager. L. J. Carson, former general manager of Link-Belt Co. Minneapolis plant, has resigned as price executive of machinery branch of the Industrial Materials and Manufactured Goods Division of OPS, and has been named general manager of Link-Belt's new plant, now under construction at New Colmar, Pa.

Lemmer Promoted by Waukesha. Harry J. Lemmer, for the past five years assistant advertising manager, has been appointed advertising manager of Waukesha Motor Co., Waukesha, Wis.

New Huber Distributor. Wing & Son Corporation, 384 Broadway, Albany, N.Y., has been appointed distributor in the Albany area for the road maintenance equipment of Huber Manufacturing Co., Albany, N.Y.

Fleming Elected Mack Vice President. Pierce J. Fleming, manager of Mack Motor Truck Corporation's Off-Highway Sales Division, has been elected a vice-president of this company.

IH Mobile Training Schools

A pair of traveling International Harvester mobile schools on industrial power products are again on the road. These mobile training units are two large

*** PROVEN efficiency!
PROVEN dependability!
PROVEN on-the-job
economy!**



STOW vibrating
screeds

Proven performance is important on any paving job. It's the reason why so many contractors are now using STOW screeds on all their road paving jobs!

STOW VIBRATING SCREEDS:

1. Permit placing more than 300 cubic yards in less than eight hours
2. Strike off and impact in one operation
3. Leave surfaces true to grade
4. Work up to and around manholes and obstructions
5. Have record of proven, trouble-free performance on the job!

STOW SCREEDS are available in beam sizes up to 30' long. Or, if you have, or prefer to build your own beam, ask about the STOW Screed Package!

STOW CONCRETE VIBRATORS

Thousands of STOW Vibrators are proving their efficiency and dependability by working under the most rugged conditions without time-losing breakdowns, without expensive maintenance.



WRITE TODAY

or see your local distributor for a copy of STOW BULLETIN S11 "Stow Concrete Vibrators and Screeds"

STOW

MANUFACTURING CO.

65 Shear St. Binghamton, N. Y.

originators of the
flexible shaft



★ International Harvester Mobile Training Unit arrives at Texas A&M. Distributor service men listening to IH Mobile Training Unit Instructor

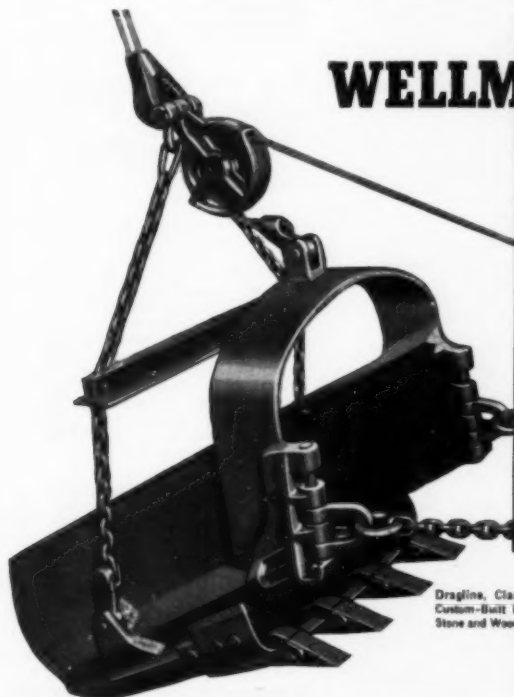


truck and trailer units each equipped with training aids of all descriptions. Each has been completely refurbished with new cutaway diesel engine and tractor chassis assemblies, slide films, charts, and other material for the new 1952 tours. These units will continue and expand the program, begun by International Harvester in 1951, of presenting service and technical information on International industrial tractors and engines to IH distributor personnel and to their contractor customers, as well

as to the armed forces and engineering schools.

The big truck and trailer units housing the equipment for these schools, traveled a total of 31,758 miles during 11 months of 1951. Programs were presented at 153 meetings to 20,283 people in the United States and Canada. Almost 1,000 armed forces personnel attended the special sessions put on for them by the IH mobile training units, and 1,186 public employees—state, county, and municipal—also attended the presentations.

Designed primarily to improve and renew service techniques of IH industrial distributor personnel, the units presented refresher programs for 5,461 distributor employees and for nearly 10,000 customers and customer employees. Nearly 2,000 of International Harvester's district office employees attended courses during visits of the mobile units, and students in engineering schools and colleges accounted for 1,165 additional viewers of special programs designed for their particular needs.



Dragline, Clamshell,
Custom-Built Buckets
Stone and Wood Grabs

WELLMAN Williams Type

MORE YARDAGE PER DAY

● Elimination of excess materials and careful weight distribution permit rapid, rhythmic operation of Wellman Dragline Buckets. Operators can cover a wider digging radius with this streamlined bucket.

Built of special alloy steel, using strong welded design, Wellman buckets provide strength and stamina for long-term economy. Perforated designs also available. You'll do better with Wellman.

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descriptive bulletins

THE WELLMAN ENGINEERING COMPANY
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YOU CAN RE-USE SISALKRAFT CURING BLANKETS 15 TIMES or MORE to cut curing costs



BETTER ROADS... BETTER PROFITS

The SISALKRAFT Method of curing concrete roads is fast, requires fewer men and no special equipment, and you're sure of:

✓ Lowest possible final curing costs and best curing results.

✓ Fifteen or more re-uses of these tough SISALKRAFT curing blankets... just roll them up and use them again!

✓ The only waterproof, reenforced blankets designed to withstand rugged road-job handling.

Designed, Developed and Proved in performance by Roadbuilders, for over 20 years

**MAIL COUPON or
write for this book**



The Sisalkraft Co., Dept. RS-4,
205 W. Wacker Drive, Chicago 6, Ill.

Please send free copy of 26-page
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Address _____

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MANUFACTURERS' LITERATURE

31

Backfiller—Tampers—Side Crane

A new 4-page 8½ by 11 bulletin (Form S120) on the Cleveland Model 80 backfiller-tamper-side crane has been issued by Cleveland Trencher Co. This one-man-operated machine backfills as it tamps as it travels. The folder uses text as well as action photographs in depicting and describing the varied operations performed by the 80, Cleveland Trencher Co., 20100 St. Clair Ave., Cleveland 17, O.

32

Diesel Pile Hammers

A 4-page catalog on its self-contained diesel pile hammers has been issued by Syntro Co. Illustrations show three models engaged in pile driving operation. Descriptive matter, data on hammer sizes for driving various types of piles and specifications are included. Syntro Co., 384 Lexington Ave., Homer City, Pa.

33

3-Wheel Rollers

A new bulletin (No. H-150) describing "general purpose 3-wheel rollers" has been announced by Huber Manufacturing Co. Illustrations and information pertain to the 8, 10, 12, and 14 ton 3-wheel rollers, gasoline and diesel. The Bulletin is two-color throughout and 20 pages. It gives a comprehensive explanation of the various parts assembled in a roller, and describes the general purpose duties of the units. Huber Manufacturing Co., Marion, O.

34

Steel Scaffolding

A revised, "1952" edition of the Waco file folder, a package file including all standard Waco literature, catalog sheets and test data, has been announced by Wilson-Albrecht Co., Inc., manufacturers of Waco steel scaffolding equipment. The folder is distributed as a permanent file for monthly mailings of Waco literature and other information pertinent to scaffold erection, use, safety measures, etc. Dept. KP, Wilson-Albrecht Co., Inc., 3565 Wooddale Ave., Minneapolis 16, Minn.

35

Tractor Tools

A catalog (No. 1191) featuring tractor tools for use with Caterpillar-built tractors and equipment has been issued by the Hyster Co. The six-page pictorial and verbal description includes the complete line of Hyster tractor tools and graphically shows practical applications of the equipment to multiply tractor uses and increase tractor production. Included in the literature is the Hystaway excavator-crane; the tractor yarder, winches and donkeys; logging arches and Sulkys; and the Hyster Grid roller. Hyster Co., Portland 8, Ore.

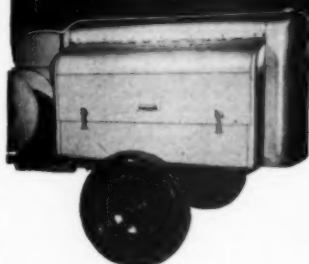
36

Fractional Horsepower Motors

A bulletin (GEA-5567) relating to its new line of fractional horsepower motors has been issued by General Electric Co. These motors embody an entirely new concept of motor design and manufacture. General Electric Co., Schenectady 5, N. Y.

Now—more than ever!

smith
the
money-saving
COMPRESSOR



smith MODEL 103-P

*Lower first cost!
Lower upkeep!*

In high-cost times, look to the Smith for compressor savings! Delivers 105 cu. ft. per minute—combines heavy duty with light weight; easily portable. Powered with the Chrysler Ind. 15 Industrial engine—6 cyl., 4" bore, 5" stroke, 377 cu. in., 3" crankshaft, 7 main bearings, sodium cooled valves and Stellite valve seats for heavy duty, long life. Compressor valves—stainless steel disc type with Manganese Bronze seats. Improved type pilot valve and simplified control... Write for literature and prices.

Also the new SMITH 75-P
AIR COMPRESSOR

Gordon Smith & Co.

Incorporated

491 College Street

BOWLING GREEN, KY.

37

Sidewalk Paving Machine

The Dotmar powered sidewalk paving machine is described in Bulletin 52 recently published. It is stated that working with transit mix units the paver can readily lay up to 10 ft. per minute of walk. By removing spacers or extensions the machine can be narrowed down to pave curb and gutter, or integral curb, gutter and walk. Screed and trowel can be quickly changed. Dotmar Industries, Inc., 503 Hanselman Bldg., Kalamazoo, Mich.

38

Digger and Loader

A 4-page circular is available on the Holmes Owen loader—a complete digging and loading attachment for trucks. Illustrations show the unit digging, scooping, loading and hauling. Descriptive matter and specifications are given. Ernest Holmes Co., Chattanooga, Tenn.

39

Heavy Duty Trailers

Illustrations, descriptive matter and specifications of RB models of trailers in capacities 15, 20, 25, 30 and 35 tons are given in a 4-page circular issued by Fontaine Equipment Co., Inc. Dimension data on level platform models and drop platform models are included. Fontaine Equipment Co., Inc., Birmingham, Ala.

40

Tractor Loaders

The Marmach loader used with International 1-6 or 1 D-6 industrial wheel tractors is illustrated and described in a 4-page circular issued by Marion Machine Co. Specifications are included. This loader has a "steam shovel" crowding action. Marion Machine Co., Inc., Marion, N. C.

41

Snow Plows

Snow plows that are quickly and easily attached to automobiles, trucks, tractors and jeeps are illustrated and described in a 4-page circular of Peerless Plow Co. Reversible blade and v types are pictured and described. Peerless Plow Co., 24 Broadway, Somerville 48, Mass.

42

Adjustable Steel Shores

A 4-page booklet giving detailed information and showing typical applications of its patented adjustable steel shores has been published by Aerow, Inc. In addition to outlining the many features of the shores and showing illustrations of actual applications, detailed information as to the sizes available, recommended working loads, and special head fittings is supplied in the bulletin. Aerow, Inc., 510 N. Dearborn St., Chicago 10, Ill.

43

Masonry Drill Bits

A new 2-color folder: New England carbide masonry drill bits and masonry drill bit guide is available. The folder shows and tells how users can drill any size hole in any masonry material with: Cyclo-core rotary bit for precision drilling in hard concrete; cyclo-twist rotary bit for drilling in soft and medium hard materials; thunderbolt hammer for drilling in hard and very hard materials. New England Carbide Tool Co., Inc., 60 Brookline St., Cambridge 39, Mass.



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TO FIT THE
JOB

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44

Land Clearing Equipment

A 4-page circular is available on two specialized land clearing equipment for use with track type tractors. The equipment includes a detachable stump, root rake, and rock rake. Illustrations and descriptions of the use of this equipment on various land clearing operations are included. Florida Land Clearing Equipment Co., Jacksonville, Fla.

45

Metal Protective Coating

A progress report is available on Dum Dum for Metal, as metal protective coating manufactured by The Arco Co. Four characteristics in the product are claimed to be outstanding: almost complete resistance to creep corrosion, unusually long life, ability to "heal itself" where the surface of the coating is ruptured, and sufficient lasting pliability under the surface to bridge expansion cracks, and even expansion joints. Dept. DMI, The Arco Co., 7301 Bessemer Ave., Cleveland 27, O.

46

Roller Bearings

Engineering data on RBC roller bearings are contained in a 104-page catalog published by the Roller Bearing Co. of America. The catalog contains three sections as follows: Section 1—product description; Section 2—dimensions, capacities, fits and tolerance, life modification factors, typical applications; Section 3—load calculations, determinations of size, load speed curve, life probability curve, mounting design, seals and closures, press fits, lubrication data, mathematical tables. Roller Bearing Corporation of America, Trenton 3, N. J.

47

Scraper

A bulletin has been issued by Bucyrus-Erie Co. on its most recent addition to the B-type family—the B-113 scraper. Designed to utilize fully the speed and power of the International TD-18A tractor, the B-113 features push bumper adjustable to eight positions, apron grills giving the operator an excellent view of the bowl during loading, "fountain" action for bigger, more uniform loads, fast hauling and clean dumping. These and the many other advantages of the new B-113 are explained and illustrated in the bulletin by Bucyrus-Erie Co., South Milwaukee, Wis.

48

Forms for Airport Paving

A description of the new Blaw-Knox heavy-duty self-aligning paving form, which was developed especially for airport paving, is included in a new 12-page bulletin 2370. The exclusive self-aligning features of Blaw-Knox paving forms are fully described. The bulletin contains detailed construction features, including the quick-operating lock-joint slide plates for connecting the forms. Complete specifications on forms from 8 in. x 8 in. to 12 in. x 12 in. are given, with additional engineering specifications and suggested purchasing specifications. Blaw-Knox Division of Blaw-Knox Co., Farmers Bank Bldg., Pittsburgh 22, Pa.

49

Milli-Second Delay Blasting

A new 20-page manual describing and illustrating eight methods of blasting in quarries with milli-second delays has been

A WATERWAY BY THE WILLARD WAY



Concrete for canals, inverted siphons and aqueducts is batched, mixed, delivered and placed by Willards in this isolated rough country job. Time and costs for both setup and takedown are a minimum for this job of intermittent and scheduled pours.

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contains previously unpublished machine-gun photographs and methods of shooting to illustrate both progressive and alternate mill-second delay techniques. Included in the manual are discussions on the principles of mill-second delay blasting, diagrams of eight mill-second delay detonation patterns, series of photographs showing alternate and progressive blasts and sketches explaining why the Rockmaster "16" blasting system gives better breakage, reduced vibration, reduced air blast, better toe action and minimized backbreak. Atlas Powder Co., Wilmington, Del.

50

Sidewalk Snow Plows

Snow plows designed especially for sidewalk work are illustrated and described in a 4-page circular of Anderson Engineering Co. One-way, reversible and v-type are covered. The plows are for use with tractors. Anderson Engineering Co., Cambridge 31, Mass.

51

Drilling Long Holes

Recommended procedure for drilling long holes varying in depth from 20 to 150 ft. with tungsten carbide Rok-Bits, long hole drilling tools and the standard percussion type drills, is fully covered in a 4-page bulletin offered by the Rock Bit Sales and Service Co. Such holes can be drilled in any type rock or ore in any direction, the manufacturer indicates, in two standard dimensions 1 1/2 in. and 3 in. Rock Bit Sales and Service Co., 2514 East Cumberland St., Philadelphia 25, Pa.

52

Concrete Pipe Coating

A new 4-page bulletin (R-2), released by Hamilton Kent Manufacturing Co., describes completely the properties and uses of Rexon Coating No. 2, the chemically resistant concrete pipe coating. Specifically developed to protect concrete pipe against the chemical attack of sewage and industrial wastes, Rexon Coating No. 2 is claimed to be virtually inert to all acids, alkalis, oils and solvents. Full details on the characteristics, working properties and methods of application of this air drying, self-vulcanizing coating are given. Hamilton Kent Manufacturing Co., 225 Goughler Ave., Kent, O.

53

Use and Adjustment of Alidades

A new 28-page pocket size service booklet on the use and adjustment of alidades has been published by W. & L. E. Gurley.

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Cost Saving Equipment

Use With 65 and 145 Concrete Mixers—Inclusive



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All steel chassis has 8"x14" oak platform, 1 beam, straight-through axle with solid steel, stub inserts, and "easy-latch" balanced tongue.



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A Crescent bucket penetrates tough materials with ease, gets a full load quickly, hauls this load at speed of 400 f.p.m., dumps automatically wherever operator desires—all with economical use of power.

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Helpful information for use of the alidade in both exploration and map making, as well as detailed instructions on stadia surveying and the use of the Beaman Stadia Arc are included in Service Booklet "C." The second half of the "C" booklet deals with alidade adjustments, and includes sections on Parallax, Striding Level, Cross-Level Rectification, Collimation, Control Level, Gradienter, Circular Level, Compass Needle, Finder Sights, and Beaman Stadia Arc Index. W. & L. E. Gurley, Troy, N. Y.

54

Motors

Design and application features of Life-Line motors (now made in ratings up to 700 hp) are described in a new 20-page booklet (B-4731) available from Westinghouse Electric Corporation. Applications in the mining, paper, chemical, central-station, lumber, and metal-working industries are illustrated and separate sections describe the special construction of motor frames, end brackets, stators, rotors, and bearings. Standard and special mountings and enclosures also are described. Westinghouse Electric Corporation, Box 2099, Pittsburgh 30, Penn.

55

Oil Burners

A new 8-page catalog describing its complete line of Hev-E-Oil Burners, published by Cleaver-Brooks Co., contains illustrations of the various sizes and capacities of the burners—including burners with maximum capacities of 5 to 60 gal. Described in illustrations are the two basic models of Hev-E-Oil Burners—the AL, AM, AMH 2, 3, 4 Series and the AM5-H, AM6-H and AM7-H Series. The catalog also includes a page of specifications of all Hev-E-Oil Burner models, with the back cover listing 14 specific features incorporated in the burners. Cleaver-Brooks Co., 326 East Keefe Ave., Milwaukee 12, Wis.

56

Hoists and Bodies

A bulletin on Models 727, 827, 1027 and 1034 hydraulic hoists and Series 200 and 300 bodies has been issued by The Perfective Steel Body Co. These hoists and bodies are for use with heavy duty trucks. The bulletin features the extra heavy-duty 150-Draulic Roll-A-Lift units for use with Perfective heavy-duty "300" series dump bodies. The Perfective Steel Body Co., Gallon, O.

57

Oilers and Supply Cans

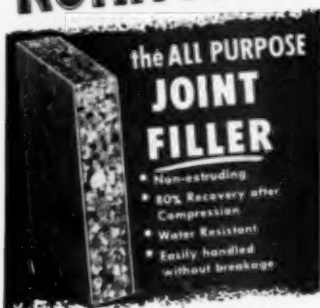
A new catalog No. 100 contains complete descriptions, specifications, capacities, etc., of Gems complete line of welded steel bench and pump oilers, supply cans, etc. Gem manufacturing Corporation, Dept. SDP, 1229 Goebel St., Pittsburgh 33, Pa.

58

Gortite-Sleeves

Gortite-sleeve protection for all operating equipment is described in a new bulletin released by A. & A. Manufacturing Co. Applications are listed for protectors as large as 24 in. in diameter and 30 ft. long. All sleeves and boots as specified in the new literature are fabricated to order from special Neoprene material that is impervious to flying chips, oil, grease and water. A. & A. Manufacturing Co., 2017 Clybourn St., Milwaukee 3, Wis.

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- NORTHWEST Model #8 Dragline, 70' boom, 2 yd. bucket, Murphy diesel, Cat. and engine overhauled.
- MARION #10A Dragline, 50' boom, 3 cu. yd. Bada diesel, air operated, excellent condition.
- MARION #302 Dragline, 60' boom, 2 cu. yd., Waukesha Hasselman diesel, vacuum swing.
- MARION #301 Shovel, 1 1/2 cu. yd., Waukesha Hasselman diesel, friction swing.
- BUCKEYE, Model 70, 3/4 yd. shovel front and 35' new Derrick boom, rebuilt one year ago.
- LIMA #1201 Dragline, Cummins diesel, older model.
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- 14-Sterling Trucks, Model HC156, 11 yd., water level bodies, end dumps with Waukesha-Hasselman 5KR gasoline engines.

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- 1-315 CFM, Ingersoll Rand, portable diesel, 1950 machine.
- 2-1250 CFM, Gardner Denver with 250 H.P., direct connected synchronous motors, complete.
- 1-1000 CFM, Gardner Denver with 20 H.P., direct connected synchronous motors, complete.

MISCELLANEOUS:

- 1-D5 Caterpillar Tractor with chain operated angle blade, serial #1H9028, rebuilt.
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- 1 48 inch shear.
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- 7—P & H 253-A, 20 ton Truck Cranes, 90' Boom 30' Jib, 1951 Models.
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- 6—Chicago Pneumatic 105 cu. ft. two stage Air Compressor, Gasoline Driven, 1950 Models.
- 1—Chicago Pneumatic 160 cu. ft. two stage Air Compressor, Gasoline Driven, 1951 Model.
- 3—Chicago Pneumatic 210 cu. ft. two stage Air Compressor, Gasoline Driven, 1951 Models.
- 2—Chicago Pneumatic 315 cu. ft. two stage Air Compressor, Gasoline Driven, 1951 Models.
- 6—Ingersoll-Rand 160 cu. ft. Diesel Driven Air Compressor, 1950 Models.
- 4—Chicago Pneumatic 315 cu. ft. Diesel Driven Air Compressor, New.
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One 1939 Model 11 Caterpillar motor patrol. This machine has good rubber and has been used two weeks since motor was completely overhauled.
One 4 to 5 yard dump box.
Three Gardner Denver heavy duty jack hammers.
One 22 ft. 18 in. conveyor with power.
One 1946, 27 ft. Portline house trailer on tandems.
One office desk and secretarial chair.
Miscellaneous small tools.
Contact
GERALD BAUMGARDT
Dodgeville, Wis. Phone 6441

FOR SALE

We have an INTERNATIONAL TD-14, wide tread, 16" track, crankshaft guard, radiator guard, front pull hitch with Hughes-Kennan MCIR Roostabout crane—14' boom—270° swing. Tractor motor, steering clutches, driving clutch, completely rebuilt—guaranteed. Crane driving mechanism rebuilt—guaranteed. Tractor drive used very little.

\$10,000, F.O.B. Albertville, Alabama

SAND MOUNTAIN TRUCK & TRACTOR CO.

ALBERTVILLE, ALA.
Phone 252

WANTED

1 $\frac{1}{2}$ yd. Backhoe
for Lorain or Osgood

Frank Swabb Equipment Co., Inc.
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GOVERNMENT SURPLUS 2 Yd. DIESEL CRANE

very little service

\$19,450

at location - El Paso Area

P & H MODEL 750 LC.

with Fairbanks Morse

Diesel Engine

68 Ft. Aluminum Boom

2 Yd. Bucket - Light Generator

Wide Tracks - Air Compressor

100's of Other Pieces

Write for Complete Free List

REX TRAILER CO., Inc.

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P. O. Box 5235 - R1-5448
DALLAS, TEXAS

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1—GALION MOTOR PATROLS, Model 116. Large tires, front and rear.
\$7,300.00 Each

2—LETOURNEAU D ROADSTERS with E 9 scrapers; 14.00 x 32—16-ply drive tires.
\$5,000.00 Each

1—LETOURNEAU FP SCRAPER, dual wheel—14 to 18 cu. yd.
\$5,500.00

1—LINK-BELT MODEL S2 COMBINATION SHOVEL—DRAGLINE: Waukesha 610Z gasoline engine. Independent rapid boom hoist, 11"4" crawler frame, 24" shoes, 8-yd. plate bucket, 30' drag line boom, 2 point sheaves, Fairleader assembly, necessary lagging, cables and counterweights.

Available for immediate delivery

All Above Listed Machines Are in Excellent Operating Condition Located Atlanta

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FOR SALE

3—Hull 15 Cu. Yds. motor scrapers powered by H8000 Cummins engines—\$5500.00 each
1—1900 gal. Etnyre distributor trailer mounted—\$1850.00
1—ten Buffalo Springfield tandem roller—\$1940.00
1—4 cylinder aircooled Wisconsin motors—\$225.00 each
4—3" asphalt pumps
5—18 Cu. Yd. hydraulic dump bodies—\$750.00 each
1—Lorain Model L-82 dragline
1—Tyler 4 x 12 2-deck vibrating screen complete—\$2,000.00
2—34 x 16 Pioneer roll crushers—\$4500.00 each
1—30 ton Rogers lowboy trailer—\$3075.00

Contact:

DICKERSON, INC.

Monroe, N. C.

Tel. 790

BARGAINS

Model 403-4A Minneapolis-Moline
64 H. P. gasoline power unit equipped with clutch, radiator, starter, generator, 20 gallon fuel tank. This motor has had very little service and is like new.

A Bargain at \$750.00

LeTourneau Model W Scraper
S/N S 27857WF, 8-18:00x24 tires in fair shape. Scraper in good condition
\$5500.00

Caterpillar No. 12 Motor Grader
S/N9K 911. Operating condition
\$4000.00

Galion Model 101 Motor Grader
S/N G23564A—large front tires. Hydraulic controls and front end completely overhauled. Motor in good shape
\$2800.00

Austin-Western Motor Grader S/N
DS 276. Operating condition
\$1800.00

All prices F. O. B. Great Falls, Montana

Central Machinery Co.

Great Falls, Montana
PHONE 5429

CONCRETE PAVING EQUIPMENT, late model

(Middle-West & Western location)

JOHNSON CEMENT BATCH PLANTS, (3) C. 5, 300 gal. capacity, gasoline or electric, 2 one-yard buckets with electric dial scales or beam scales. With railroad unloading screw and truck hopper. Each with 400 lbs. bins.
JAGER Finishing Machines, Mdl. H, 20-25 ft.
KOERING Longitudinal Floats, Mdl. LF, 20-25 ft.
KOERING 34-E Dual Drum Pavers.
INTERNATIONAL R&S—7 Double Trucks with 18" hydraulic double batch bodies, 5 cu. yd. capacity, 1" heavy duty tires.

Crushing & Screening Plants

UNIVERSAL 20100 Primary Portable Jaw Crusher, pneumatic tire, air brakes, Apron Feeder, D-800 Cat, Diesel, 30" Underconveyor, 95% new, \$16,000.00.

CEMAR RAPIDS Secondary Portable Hammermill, 20000 Mill, D-17000 Cat, Diesel, 95% new, \$16,000.00.

UNIVERSAL Twin Dual Master Gravel Plant, D-13000 Cat, Diesel, Used 1000, \$25,000.00, also 2600 Jr.

IOWA 225-40 RB. Jaw Crusher, Grooved wheel, Used 75,000 tons soft limestone, Guaranteed like new, \$8,500.00. Can furnish Apron Feeder for same.

IOWA 3-unit 2540 Portable Crushing & Screening plant.

UNIVERSAL 15"-36" P.R. Crusher, Good, \$2000.00.

UNIVERSAL 15"-36" R.E. \$2500.00, FB, \$1000.00 Jaw Crushers.

PIONEER 40"-22" R.B. Double Roll, Al, \$3750.00.

UNIVERSAL Twin Dual Double Rolls, 24"-14" & 24"-10" Finishing rolls, Al, \$2500.00.

SECO, Simplicity & Swisher vibrating screens, Conveyors. We specialize in them. What do you need?

KOERING (6) DUMPTONS model WD60. Late model, Al condition, \$6950.00 each, Located Arizona.

PIONEER Portable Conveyor, 24", 50 ft. Hyd. raising & lowering, On rubber. Practically new, \$2300.00, Arizona.

CAT D-8 205085 Doser, No. 25 Cat. Controls, Rebuilt, \$12,500.00, Arizona.

LETOURNEAU Model LP, 12 yd. scrapers, Good, \$3450.00 each, Arizona.

WENZEL MACHINERY RENTAL & SALES CO.

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ATTENTION MUNICIPALITIES AND HAULERS

12—St. Paul dump bodies and hoist model PL, low mount, 6 $\frac{1}{2}$ cu. yd. 12' long, 7' wide, 24" sides and ends. Tarp and tarp winch, 90% PL from front of body to center line of wheelhouse. Excellent for refuse and general hauling.

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ELECTRIC LOCOMOTIVES,

with extra batteries

- 1—Whitcomb, 10 Ton, 36" Gauge
- 6—Greenberg, 11 Ton, 36" Gauge

MUCKING MACHINES

- 3—Elmo Rockershovals, Model 40
- 4—Conway-Muckers, Model 25

CARS

- 36—4 Cu. Yd. Side Dump, 36" Gauge

MISCELLANEOUS

- 2—Elmo-Cassengerly Blowers, 2000 c.f.m.
- 4—40 K. W. Battery Charging Units
- 2—20 K. W. Battery Charging Units
- 16—Ingersoll-Rand 3/4 S. wet type, Drifter Drills
- 2—Ingersoll-Rand 5-70 Motor Feed Drifters
- 10—Ingersoll-Rand No. 228 D/B Drill Booms
- 1200—Ground feed 24" Vent-Pipe, 14 Ga. Lock Joint
- 2—40 K. W. Diesel Generator Sets
- Transformers, various sizes
- Electric Cable
- Electric Pumps, various sizes

Subject to Prior Sale

FRAZIER-DAVIS CONSTRUCTION CO.

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Grahamville, New York, Box 153Sterling 1950
Grahamville 2861

FOR SALE

BYERS Model 61

Travelers Dragline 1/2 Yard

Serial No. 6286. Hercules 4 cyl. Gasoline Engine, 30 ft. Boom, 1/2 yard Bucket. Machine has been used less than 30 days.

REASONABLE

Must be seen to appreciate this terrific buy

**SWEENEY BROTHERS
TRACTOR CO.
FARGO, NORTH DAKOTA
Ph. 2-3306**

FOR SALE

- 1—K-12 Inley crane, 35 foot boom. Excellent condition. Used approximately 2100 hrs.
- 2—4 cu. yd. Dragline Buckets.
- 1—16-S Smith Concrete Mixer, with water pump, batch meter. Powered with 4 cylinder Wisconsin engine, 4 wheel rubber mounted. Used very little, excellent condition.
- 1—16S Koehring Concrete mixer, with water pump and batch meter. Powered with 4 cylinder Wisconsin engine, 2 wheeled rubber mounted. Very good condition.
- 1—Johnson Batch Bin with trolley scales, 31 ton heaped capacity. Used very little, same as new.
- 1—Littleford Trail-O-Roller, Model 155. Used very little, same as new.
- 2—Fairbanks-Morse 3 beam wheelbarrow scales. Very good condition.
- 2—International Winch trucks. Long wheel base. Heavy built bodies. Thoroughly overhauled recently, very good condition. Rated as 2 to 3 ton capacity on truck. Heavy winches.
- 1—3" Gorman-Rupp centrifugal water pump. Same as new.
- 1—2" Gorman-Rupp water pump. Same as new.
- 1—1 1/2" Gorman-Rupp jet pump. Same as new.

All equipment mentioned above is at our Yard in Beatrice, Nebraska, and is subject to prior sale.

JAMES A. KNAPP

General Contractor
630 Irving Street Phone 177
Beatrice, Nebraska

FOR SALE

- BUCTYRUS-ERIE model 120-B dragline
- BUCTYRUS-ERIE model 54-B shovel
- BUCTYRUS-ERIE model 38-B shovel & drag
- BUCTYRUS-ERIE model 22-B shovel & backhoe
- NORTHWEST model 4 shovel
- NORTHWEST model 80-B shovel
- NORTHWEST model 80-D shovel & drag
- NORTHWEST 95 DRAGLINE
- LIMA model 1201 dragline
- LIMA model 1201 shovel
- P & H model 955 dragline
- P & H model 1055 dragline
- BAY CITY model 65 shovel & drag
- 10—EUCLID rear dump trucks 22 ton
- 10—EUCLID rear dump trucks 15 ton
- 2—Caterpillar Model D8s
- Manitowac Model 4500 dragline caterpillar
- 4—Tractors model 7s
- BUFFALO-SPRINGFIELD 10 ton roller
- LETOURNEAU model LP scraper
- CEDAR RAPIDS portable crushing plant
- CEDAR RAPIDS asphalt plant

Write Box 1075

ROADS AND STREETS

22 W. Maple St.
Chicago 10, Illinois

FOR SALE

- 2—Euclid model 48 FD rear dump trucks approximately 4 years old. GMC diesel engines. Good rubber.
- 1—D-8 Cable controlled angledoser, late 2U series.
- 1—Lorain 82 Shovel. Standard front - 2 yard dipper.
- 1—Buckeye Model 79; 3/4 yard Shovel, gasoline engine, standard front.
- 1—2 yard AMSCO dragbucket.
- 1—1 1/2 yard AMSCO dragbucket.
- 2—2 yard Blow-Knox clambuckets, complete with teeth and counterweights.
- 1—Cletrac bulldozer, model FD, Hercules diesel engine.
- 1—Battery Locomotive, low cost, 5 ton 36 inch gauge. Battery charging outfit.
- 1—Jeffrey cutting machine, 35-L, 30 h.p., 220 A.C. 3 phase, 60 cycle, height 18 inches. This machine never used.
- 1—Lot approximately 15000 feet 4.0 insulated copper wire, New on reels.

All above stripping equipment now being operated on coal stripping job by owner and seller in Clearfield County, Pa.

CENTRAL MOSHANNON
COAL MINING CO.

HOUTZDALE, PA.
Phone 4013

FOR SALE

- ONE USED CLYDE MODEL HBT HOIST AND TOWER
- W/80" Tower 2 drum Clyde Hoist, Reconditioned. Wisconsin Gasoline Motor. Location: Springfield, Missouri.
- TWO USED JAEGER 165 CONCRETE MIXERS
- One Rubber Mounted Robuilt Wisconsin Gasoline Motor, A-1 Condition. Location: Eastern Kansas.
- TWO 23 T WINSLOW
- 2 Compartment Binbatch Units. Location: Eastern Kansas.
- ONE USED CLETRAC MODEL H. G.
- GASOLINE Powered
- w/ 1/2 C. Y. Ware Hydraulic Loader, completely reconditioned, new 1960. Location: Missouri.
- ONE OWENS 3/4 C. Y. Model 230 Clamshell Bucket, A-1 condition. Location: Eastern Kansas.
- All Prices F. O. B. Location

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Position open for engineers experienced in structural materials such as concrete, soils, bituminous and related materials, and designs for construction of roads, airport paving and drainage structures. Work location covers states of New York and New Jersey. For information apply Personnel Branch, Office of District Engineer, U. S. Army Corps of Engineers, 80 Lafayette Street, New York 13, New York.

FOR SALE

Scraper, LeTourneau Model W with four 24:00x32 tires.

Scraper, LeTourneau Model FU, 17-23 yds., with two 18:00x24 tires and two 24:00x29 tires.

Tractors, Caterpillar D8 with LeTourneau DD PCU 1H series.

PHILLIPPI-MURPHY
EQUIPMENT CO.

340 Heaver St., N.E., Minneapolis
Phone: Gladstone 5921

FOR SALE

1—Allis Chalmers Model "S" Tractor, equipped with Baker bulldozer blade.

1—Complete Shovel Front for P & H Model 400, 3/4 c.y. Crane.

1—Backhoe Attachment for 30" ditch, for P & H Model 400, 3/4 c.y. Crane.

R. D. Golden

Industrial Engineers & Contractors
100 Pine Street
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AIRCRAFT CABLE—FLOW STEEL CABLE
1/16" to 1"—1,000,000 ft. All New

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- 1—2 CY Mixermobile used only 120 hours. All hydraulic controls. In very good condition.
- 1—Buggymobile.
- 1—80 Ton Capacity 3 bin Noble batch plant with dial scale reading. Like new.
- 1—Allis Chalmers HD-5G Tractor Loader—Used very little.
- 1—Model D Cletrac Tractor with hydraulic mixer.
- 1—2-3 CY Ransom Transit Mixer mounted on heavy duty 2 1/2 Ton GMC truck. In good condition.
- 1—1/4 Dragline bucket.

ASKEVOLD
Construction Co., Inc.
Box 1125
MISSOULA, MONTANA

FOR SALE

1—Portable self-propelled, two unit gravel crushing plant; comprised of 10" x 36" roller bearing primary crusher together with power, conveyors and scalping screen in one self-propelled machine and 18" x 30" Rolls with power, conveyors and grading screen in the other self-propelled unit.

These machines are in good mechanical condition and have produced up to 100,000 cu. yds. per season of state specification material.

1—Self-propelled, pneumatic-tired gravel crushing plant embodying the Hicken-Ander-son 10"-36", 5"-36" double jaw crusher. Machine is in good mechanical condition, capacity 500-600 cu. yds. per day 1" material.

These units are our own design and we can supply all repair parts.

**HIGHWAY
MACHINERY CO.**
420 FREDERICK ST.
WAUKESHA, WIS.

SHOVELS DRAGLINES EUCLIDS

1201 Lima Standard Shovel, with 18' 11" crawlers, 44" reach, 52' 6" boom, 22' dipper handle, 3 1/4 yd. dipper and 8 cyl. Cummins diesel engine. Like new.

1201 Lima Dragline, with 85' boom, 3 yd. Pape bucket, Kohler light plant, 18' 11" x 44" crawlers. Machine delivered new October, 1949. We are now completely overhauling and will guarantee. Real bargain.

955 P&H L.C. 2 1/2 yd. Dragline, with Caterpillar D-17000 engine, Kohler light plant and 81' boom with extra 10' boom section. Has independent boom hoist. Rebuilt and overhauled short time ago. Real buy.

1600 Manitowoc Dragline-Crane, 75' boom, 2 yd. bucket, independent boom hoist; D-13000 Caterpillar engine.

2 — 48-FD Euclid Rear Dump Trucks, 13 1/4 yd. truck measure; G.M. diesel engine.

2 — HD-19 Allis-Chalmers Tractors with 520 Garwood 18 yd. Scrapers. Used very little. In excellent condition.

1 — FDE Cletrac Tractor with 4F-2163 Caterpillar 13 yd. Scraper. Very good condition.

**FRANK SWABB
EQUIPMENT CO., INC.**
313 Hazeltown Nat'l Bank Bldg.
Hazeltown, Pa. Telephone 4910

15 TON EUCLID Rear Dump Trucks

Good Condition. Large Grasp to Chasse Frame.

STANDARD EQUIPMENT CO.
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SPRING BARGAINS

CRANES & SHOVELS

Inslay "K-12" Used 1/2 yd. Hoe or Dragline. Gas Inslay "K-12" Used Diesel 1/2 yd. Dragline. 1945 model Inslay "L" 3/4 yd. Dragline. Used two months Inslay "L" New 3/4 yd. Dragline or Crane. Used four days Unit Used Trench Hoe Attachment for "314" Unit Used Dragline Attachment for "514" American New 10-ton Single Sheave Hook Block

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CMC "68" Used 1-Bag Mixer @ \$600.00 Jaeger "68" Used 1-Bag Mixer @ \$650.00 Rex "27E" Paver. Big Drum, ready to pave Smith 3 yd. Used Hi-Discharge Moto-Mixer w/o Truck Rex 2 yd. Used Hi-Discharge Moto-Mixer, mounted on Ford Tandem Truck Rex 2 yd. Used Hi-Discharge Moto-Mixer, w/o Truck

MISCELLANEOUS

IHC "UD-6" New Diesel Power Unit @ dealer's cost Henke "70" Used Maintainer, 10' Blade, Hydraulic @ \$1250.00

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EQUIPMENT FOR SALE

CHAIN HOIST

- 1-10 Ton Hercules - Spur geared. Our Price \$340.00
- 1-2 Ton Hercules - Spur geared. Our Price \$105.00
- 1-3 Ton Chester - Spur geared. Our Price \$135.00
- 3-2 Ton, Slightly used, screw geared. Our Price \$45.00 each.

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1 1/2" to 2 1/2", 4 point 1" socket 10% Discount on orders \$100.00 or Over

3 GASOLINE ENGINES

Continental Model M330, 75 H.P.

- 1 New \$575.00
- 1 Factory Rebuilt \$450.00
- 1 Used, excellent condition \$360.00

POWER UNIT

- 1-Model U-2 International Power Unit, 22 H.P. incl. Radiator and Clutch. \$275.00

7/8" ROPE

3/4" Rope, 32c lb., about 260 lbs. per bale. (Bales only)

450 ELECTRIC MOTORS 450

1/4 To 125 H.P.—New and Used

SHOVEL & CRANE

- 1-P&H Model 255A, Serial #11907 Shovel and Crane less crane boom and tagline, \$12,000.00 F.O.B. our yard.

This machine is in excellent condition.

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DEPENDABLE USED MACHINES

Lorain 40 dragline Hanson truck crane Univ. Lorain 1 1/2 yd. backhoe New 18" x 100" conveyor Pioneer 4 x 8 screen 3 yd. Grumports

TRACTOR & EQUIPMENT CO.
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NORTHWEST 80D Shovel, 1945 machine.

KOEHRING 303 Shovel, drag Diesel 3/4 yd.

NORTHWEST model 4 shovel drag, gas, 1 yd.

GENERAL 407 drag 50' boom, 3/4 yd., '42 machine.

BUCYRUS-ERIE 22B shovel and backhoe.

OSGOOD 1006 shovel or crane, 1949 machine.

MARION 38A drag, 70' boom, 2 1/2 yd. bucket, Buda Diesel.

NORTHWEST Model 5 Com. shovel and drag, 45' boom, 1 1/2 yd. bucket.

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Write—Phone Today!

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CONSTRUCTION MACHINERY
CLINTON, INDIANA
PHONE: 1223W

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One Cleveland Model 140 Trencher, 24" cutting width. Diesel motor. Used on only 5 miles of ditch. Like new. \$8,000.00.

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Simplicity S-100 Guaranteed to be in excellent running condition. Production is 100 to 125 Tons Per Hour

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5 Caterpillar D8 3 Caterpillar D4 4 International TD 14 27 Allis-Chalmers MD 14
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3 Bucyrus Erie 150 Draglines 1-yd.
1 Inley K12 Crane, 1-yd.
1 Inley K12 Buckhoe, 1-yd.
1 P & H Dragline, 1-yd.
1 Bay City 15A Trucon, 1-yd.
1 P & H 250A Crane, 1-yd.
1 Myers 83 Shovel, 1-yd.
1 Northwest 25 Crane, 1-yd.
1 Keekling 504 Crane, 1-yd.
1 Link-Belt L85 Crane, 1-yd.
1 Keystone 15A Crane, 1-yd.
2 Northwest 500 Barge Mount Draglines, 2 1/2-yd.

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7 Caterpillar 12
4 Gallion 181
1 Galion 281
2 Adams 412W
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6 Super C, Teunissen, 12 yd.
2 Weldridge Terrascrapers, 13 yd.
1 LeTourneau D, 4-yd.
2 LeTourneau L5, 4-yd.
1 LeTourneau SU 12-yd.
7 Weldridge BBS, 5-yd.
1 Blower McLean, 10-yd.
6 Daniels 811, 9-yd.

MISCELLANEOUS

3 EC 31 Athey Dump Trailers
2 FC 31 Athey Dump Trailers
TAMPERS—COMPRESSORS—FORK LIFTS—
ROAD ROLLERS—JACK HAMMERS—WELDERS—
WAGON DRILLS
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SHOVEL FRONTS FOR NW25 & NW5

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FOR SALE

- 16-8 Tellmuth Gyrotary Crusher, Serial No. 4437 with Drive
- 1—48 inch x 18 ft. Tellmuth Apron Feeder, 15 H.P. Reeves Drive
- 1—D7 Caterpillar Tractor, Serial No. 7M4H979 S.P. with D.D.P.C. Unit and LeTourneau Angle Doser
- 1—D8 Caterpillar Tractor, Serial No. 1H9086 with D.D.P.C. Unit and LaPlant-Choate Bulldozer
- 1—D8 Caterpillar Tractor, Serial No. 1H9182 with D.D.P.C. Unit and LeTourneau Bulldozer
- 1—Model K-38 LeTourneau Rooter
- 1—Grace Double Drum Sheep Foot Tamping Roller
- 1—8 Cu. Yd. Pneumatic Controlled 2 Comp. Concrete Buckets
- 2—2 Cu. Yd. R62K Blaw-Knox Hand Operated Concrete Buckets
- 1—1 Cu. Yd. Model 531 Blaw-Knox Concrete Bucket
- 1—100 HP Reliance Vertical Boiler complete with Oil Burner
- 2—Type H.A.F. 18-10 Gardner-Denver 213x14 Horizontal Air Compressors, 1320 CFM each
- 1—Type H.A.E. 18-34 Gardner-Denver 19 1/2x12 Horizontal Air Compressors, 1000 CFM

Other Items & Equipment for Sale,
Pumps, Motors, Transformers, etc.

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FOR RENT

(1) 55-B and (1) 75-B Locomotive shovel-crane.
Both are 1-C.V. machines and are in first-class operating condition.

THOS. C. BROWN CO., INC.
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FOR SALE OR RENT

N.W. MODEL 80D SHOVEL—Serial in 8100 Series. Murphy Diesel Engine. Machine in operating condition. Needs some repairs. Priced, present location, \$27,000.

NORTHWEST MODEL 25 SHOVEL—2 years old, powered by "Caterpillar" D318 Diesel engine, standard dipper, excellent condition (Will consider rental).

BARBER-GREENE PORTABLE CONVEYOR—30 ft. centers, 24" belt, Wisconsin engine, mounted on pneumatic tires, same as new, only used to unload 15 carloads of material. Serial No. 363-50-67.

Pershing Equipment Co., Inc.

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- 1—101 Gallion Motor Grader
- 1—Adams 31 Motor Grader
- 1—A. C. Gas Motor Grader
- 1—Cat. # 10 Motor Grader
- 2—10-Ton 3 Wheel Huber Rollers
- 1—105 Sullivan Compressor
- 1—105 Jaeger Compressor
- 1—1/2 Yd. Clamshell Bucket
- 1—8" Jaeger Pump
- 2—New 115 Smith Concrete Mixers

CENTRAL SUPPLY & EQUIPMENT CO.

Box 322, Danville, Ky. Phone 2220

FOR SALE

1—1949 D-7 Dozer w/front mounted cable control. Serial No. 3T9656.

1—1948 D-7 Dozer Serial No. 3T8196 DDPCU.

2—1950 LF210 International Heavy Duty body, Tandem drive.

1—1950 1/2 yd. Inley Dragline, Model L, 40 foot boom, fairlead, swamp pads, diesel power, like new.

1—No. 12 Caterpillar Motor Grader Serial No. 8T81, scarifier, cab, lights, 100 H.P.

G. H. LINDEKUGEL & SONS
SPENCER, SOUTH DAKOTA
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WANTED STEAM ROAD ROLLER STEAM FIRE ENGINE

Also interested other items of steam industrial, railway, etc. machinery. The older the better. Not necessary be in operating condition as wanted for museum purposes.

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One Caterpillar D7 Tractor. Serial #3T5936, Equipped with a Traxcavator Serial #T7258. \$4500.00.

One Caterpillar D4 Tractor, Serial #5T441W, Equipped with a Model T4 Traxcavator, Serial #280. \$4500.00.

MR. CHET HERRINGER

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210 CFM SCHRAMM AIR COMPRESSOR

Serial #310346, R/M, #MF210, 4FI-J Model, 1210 RPM, Buda Gas engine drive, mounted on four tire trailer, run 2 hours since completely overhauled. \$2,500.00.

ELECTRIC CRANE

BAKER crane, mobile, 20 ft. boom, model CYA40, serial #27403, 3 ton cap., complete with battery and charger. Condition excellent. \$2,500.00

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- 22 ton tandem low bed trailers
- 12 to 15 ton low bed trailers
- 10 ton tilt trailers
- 1945 White 4 x 4 Diesel

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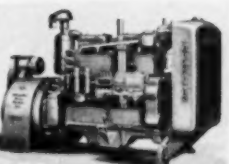
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COMMENT

from the

BUTLER ENGINEER

Of Building Booms and Brassieres with Bullets

Well, I'm back to a diet of gruel, brewer's yeast and gallons of milk after the carousel at the Ready Mixed Convention in Chicago and the Concrete Products jamboree in New York. Too much terrapin and lobster, I guess. Couldn't be anything else.

Seriously, the best parts of both meetings were the opportunities to renew old friendships and make a lot of new ones. I do want to thank everyone — past, present and future owners of Butler Plants—who stopped for a visit at the Butler exhibits. It's heartwarming to know there are so many friends of the products we make and of the organization that makes them.

Have any of you been up to Canada recently? They're in the most spectacular, triple-barreled, hell-a-whippin' construction program I've ever seen. And the money to pay for it, too.

I look at the controls, artificial shortages, arguments, red tape and indecision on our side of the border and I feel we're "fiddling while Rome burns." *Canada, gentlemen, has thrown the fiddle away and picked up the trowel.*

And if they say they're going to build the St. L. Seaway alone if necessary — it ain't exhaust from an idling engine. They can do it and will — and we'll pay at their toll gate.

Sat in the audience at a T-V studio in New York. Western stuff. Girl a couple of seats over said, "What do you call that thing the cowboy's wearing — you know, that brassiere with bullets?" *Shades of Buffalo Bill! What a name for a shoulder holster!*

Yours for better roads
and more of 'em,

The Butler Engineer

BUTLER BIN COMPANY
WAUKESHA, WISCONSIN

INDEX TO ADVERTISERS

A & P Crane Rental Co.	126	LaPlant-Chaste Mfg. Co.	2nd Cover
Adair Drill Company, Inc.	122	Larson Piling Corp.	138
Adams Mfg. Co., J. D.	47	Lawrence, Olin E.	128
All Purpose Spreader Co.	104	Layne Contractor, Inc., H. B.	135
Allen-Chastang Mfg. Co.	34-35	Lecher & Sons Mfg. Co., A.	83
American Bitumuls & Asphalt Co.	103	LeFramme, Inc., B. G.	16-17
American Cable Div. (American Chain & Cable Co.)	3rd Cover	Lindquist & Sons, G. H.	134
American Hoist & Derrick Co.	10-31, 121	Littelford Bros.	100
Armco Steel Corp.	46	McClanahan, Roy	126
Aschfeld Construction Co., Inc.	133	Machen Iron Works, Inc.	100
Asphalt Equipment Sales Co.	135	Maintenance Co., Inc., The	126
Atlas Products Corp.	52	Marchess Co., A.	133
Austin-Western Company	23	Marion Metal Products Co.	36
Baker Manufacturing Co., The	81	Matth Construction Co.	135
Baldwin-Lima-Hamilton Corp.	87	Medlin Packing Co.	134
Barber-Greene Company	1	Meyer, Truck Co.	134
Beltite Products	98	Michigan Power Shovel Co.	116
Blue Ball Machine Works	131	Miller Research Engineers	123
Bode-Finn Co., The	131	Missouri Valley Equipment Co.	128
Borah, J. Carroll	128	Missouri Valley Equipment Co.	127
Bowers, Stanley J.	128	Missouri Valley Equipment Co.	129
Brent, Lang	128	Missouri Valley Equipment Co.	134
Briess & Stratton Corp.	82	Moore Equipment Co., H. W.	129
Brown Co., Inc., Thos. G.	134	Mount Morris Saw Builders	134
Bucyrus-Erie Co.	26-27	Nystic River Sales Co.	130
Buda Company, The	14	National Boiler & Equip. Co.	134
Buffalo-Springfield Roller Co.	20	Ohio Oil Company	88
Burden Sales Company	135	Oiler Corporation, The	109
Butler Bin Co.	136	Overman Mfg. Co., L. J.	100
Butler-Sparks Equipment Co.	133	Owen Bucket Company	78
Cameron, Joyce & Co.	127	Parson Company	10-11
Carter Pumps	114	Pennsylvania Flexible Metallic Tubing Co., Inc.	107
Caterpillar Tractor Co.	29	Penney Contracting Co., Inc.	138
Central Machinery Co.	132	Perfection Steel Body Co., The	22
Central Mechanical Coal Mining Co.	132	Perkins Equipment Co., Inc.	134
Central Supply & Equip. Co.	134	Perkins-Murphy Equipment Co.	132
Chrysler Motor Division (General Motors Corp.)	126	Pittsford Cement Association	40
Cleveland Contracting Equipment Co.	126	Quick-Way Truck Shovel Co.	42
Climax Mfg. Co.	43	Republic Power & Equip. Co.	126
Clifton Construction Co.	127	Rex Trailer Co., Inc.	131
Celerado Fuel & Iron Corp., The	75-76	Rocke Const. Co., Inc., Edw. M.	126
Contractors Machinery Co.	127	Roebbing's Sons Co., John A.	33
Contractors Machinery Co.	138	Rubin Bros.	132
Corps of Engr., U.S. Army	132	Romelle Mfg. Company	117
Dewey and Almy Chemical Co.	105	Rubridge-Johnson Equipment Co., Inc.	127
Di Cicco Construction Company	129	Safety Traffic Cones Corp.	117
Dickerson, Inc.	131	Sand Mountain Truck & Tractor Co.	121
Dier Company, R. E.	169	Saunders Bros., Inc.	130
Dodge Division (Chrysler Corporation)	8	Serodini, Inc., V. P.	130
Eaton Mfg. Co. (Axle Div.)	73	Service Supply Corporation	127
Eau Claire Sand & Gravel Company	125	Servicized Products Corp.	131
Eighty Equipment Co.	133	Shamrock Equipment Company	124
Embury Mfg. Co.	124	Shunk Mfg. Company	111
Ernst & Co., E. D.	89	Simplicity System Co.	131
Fabrick Tractor Company, John	129	Sinkinger Supply Co.	133
Fahrer Tractor & Equipment Co.	123	Siskcraft Company, The	120
Fish Co., Charles V.	123	Smith & Company, Inc., Gordan	133
Fisher, Al	128	Standard Equipment Co.	101
"Flexible Road Joint Machine Co.	44	Standard Oil Company (Indiana)	100
Flintkote Co., The	41	Standard Steel Works	106
Forte Co., Inc., The	21	Stanhope, Inc., R. C.	135
"Ford Motor Company	125	Statham Machinery & Equip. Co.	131
Forke Brothers	132	Steady Company	118
Frazier-Devis Construction Co.	129	"Stow Manufacturing Co.	136
Friddle, F. H.	129	Strubel, A. J.	128
Gallon Iron Works & Mfg. Co.	3	Swabb Equipment Co., Inc., Frank	127
Gar Wood Industries, Inc.	38-39	Swabb Equipment Co., Inc., Frank	131
Gibbs-Cook Equip. Co.	128	Swabb Equipment Co., Inc., Frank	133
Golden, R. D.	132	Swager-Krishan Co.	129
Goodyear Tire & Rubber Co., Inc., The	48	Thow Shovel Co., The	9
Grace Mfg. Co., W. E.	100	"Timken Roller Bearing Co.	Front Cover
Graddall Division of the Warner & Swasey Co.	5	Trackson Company	24
Green, Martin	129	Tractor & Equipment Co.	133
Groves & Sons Co., S. J.	129	Tractors for Export, Inc.	129
Hardy Scales Co.	100	Trayer, Stanley B.	135
"Harnischfeger Corporation	112	Union Wire Rope Corporation	113
Harris Machinery Co.	127	Unit Crane & Shovel Corp.	124
Harris Machinery Co.	135	United States Motor Corp.	130
"Hettzel Steel Form & Iron Co.	79	United Tractor & Equipment Corp.	130
Herringer, Chet	134	"Universal Engineering Corp.	Back Cover
Hetherington & Berner, Inc.	102	Vanderwater Auto Sales	135
Highway Machinery Co.	133	Viber Company, The	115
Hitz Construction Co.	135	"Vulcan Tool Mfg. Co.	123
Hogan, Chas. H.	129	Warner & Swasey Company	5
Horn Co., Inc., A. C.	48	Watkins-Aldridge Equipment Co.	129
"Hough Co., The Frank G.	18	Watson Co., Inc., Emmett C.	126
Hyman-Michaels Co.	126	Wellman Engineering Co., The	119
Hyman-Michaels Co.	130	Wentz Machinery Rental & Sales Co.	130
Hyman-Michaels Co.	134	West River Equipment	135
Illinois Road Equipment Co.	127	Whitler, R. H.	134
Ingersoll Co., The Chas. M.	127	White Mfg. Co.	100
International Harvester Co.	6-7, 12	Willard Concrete Machy. Sales Co.	122
J & P Construction	128	Williams Tractor Co.	126
Jackson Vibrators, Inc.	118	Wilson, Ram	125
"Jeep Machine Co., The	37	Winstow Government Standard Scale Wks., Inc.	121
John Trailer Div. (Pressed Steel Car Co.)	80	Wisconsin Motor Corporation	121
Jenkins & Baumgardt	131	Advertisers with * are represented in the 1952 edition of Gillette's Heavy Construction Product Catalog. Please refer to it for additional information on any of their products.	
Jewett & Sowers Oil Co., The	130		
Johnson Company, C. B.	10-11		
Kaw Paving Company, Inc.	126		
Knap, James A.	132		
Krohnig Company	10-11		
Koppers Company, Inc.	86		
Kwik-Mix Company	10-11		
Lampert and Lampert, Inc.	128		



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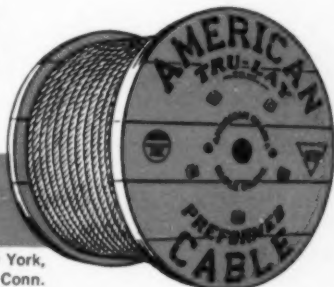
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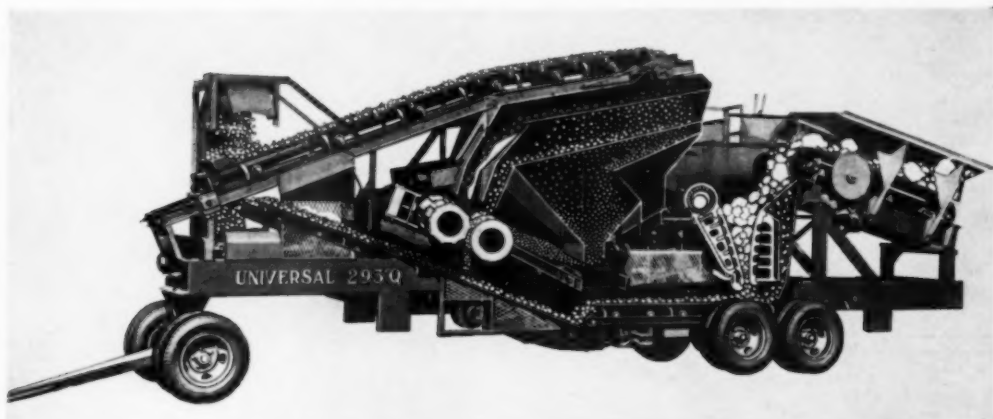


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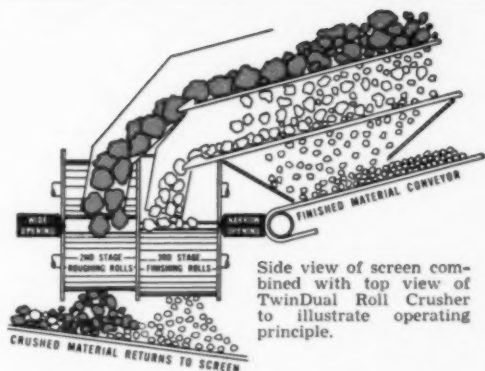
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